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"Even as we have been approved of God to be intrusted with the Gospel, so we speak; not as pleasing men, but God which proveth our hearts."

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CLOUD-BREAK.

BY ARCHIBALD LAMPMAN.

With a turn of his magical rod,
That extended and suddenly shone,
From the round of his glory some god
Looks forth and is gone!

To the summit of heaven the clouds
Are rolling aloft like steam;
There's a break in their infinite shrouds,
And below it a gleam.
O'er the drift of the river a whiff
Comes out from the blossoming shore,
And the meadows are greening, as if
They never were green before.

The Islands are kindled with gold
And russet and emerald dye;
And the interval waters outrolled
Are more blue than the sky.
From my feet to the heart of the hills
The spirits of May intervene,
And a vapor of azure distills
Like a breath on the opaline green.

Only a moment, and then
The shadows of daytime decline
On the eyes of immortals and men
That were wide and divine.

Ottawa, Canada.

THOUGHT.

BY JOE RUSSELL TAYLOR.

From star to star my thought flew, like a bee
From thistle-top to thistle-top at noon,—
Came back with pollen of old suns to me,
Music of Mars, and fragrance of the moon.

Columbus, O.

LOVE AND DEATH.

BY ELIZABETH WORTHINGTON FISKE.

Death beckoned Love, and said: "Come thou with me;
I gather every rose,
I dim earth's fairest shows,
All souls of men, all things in their degree
My sway confess—then why,
Smiling, dost thou deny,
Slight one of gauzy wing, my right in thee?"

Love gently laughed and shook his shining head:
"Nay! *I* am sovereign King!
Tho every flower of spring,
All life before thy face grow wan with dread;
Should each rejoicing star,
In the blue fields afar,
Swing blind through voiceless space, extinguished, dead;

"Yet would I plume these wings, and mount on high
To the great Source of Light,
And in fresh splendor dight
Return, the earth to bless, from yonder sky:
Wide is the realm I own,
No shadow fills my throne;
Love is supreme, for love shall never die!"

Even as he spake, a phantom pale and spare
Death dwindled, and as mist
By joyous sunshine kissed,
At Love's bright smile he vanished into air!
And men with raptured cry,
And songs of victory,
Hailed Love the King, that ever crown shall wear.

Ithaca, N. Y.

THE AGE OF ELECTRICITY.

Steam Superseded.

TELEGRAPHS AND TELEPHONES.

ELECTRIC LIGHTING.

In the Household.

ELECTRIC RAILWAYS.

IN EDUCATION, LITERATURE AND BUSINESS.

A SYMPOSIUM BY

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THE FUTURE OF ELECTRICITY.

BY PARK BENJAMIN.

Any useful invention or discovery is the product of two factors, the man who originates it, and the times in which he lives. Both are essential, and both must coact. There has been no period in the world's history when every sign pointed more markedly to the imminence of great and marvelous discoveries than the present. Equally, there has been no time when more men—cautious, skillful, patient investigators—have been at work under strictly scientific methods to make Nature reveal the secrets the existence of which can now, for the first time, be dimly discerned. And in all the fields of human endeavor there is none in which the promise and potency of future achievement is greater than in that of the development of that wonderful form of energy which we know as "electricity."

In this field progress is advancing in two paths; the one leading to the production of the force cheaper than by known means, and the other toward new devices and ways for applying it to the practical needs of mankind. The first path is the least attractive; but it leads to by far the most momentous discoveries as affecting our every-day life. The current which now supplies our lamps and motors is obtained by revolving a coil of wire in the field of a magnet. The steam engine does this just as it turns a coffee mill, or a churn, or a lathe. Therefore, coal is burned under the boiler to produce steam, and steam drives the engine, the engine turns the dynamo, the dynamo delivers its current on the wires which lead to the lamps. Hence the efficiency of the whole system depends mainly upon the efficiency of the engine and boiler which furnish the power. The best engine and boiler does not utilize more than ten per cent. of the energy locked up in the fuel; and this is due, not to faulty construction or bad management, but chiefly because of natural laws mainly dependent upon the temperature in which we live. To improve the dynamo or the lamps simply means greater economy in the utilization of the obtained ten per cent. It does not affect the problem of how to get more than ten per cent., and that is the great discovery of the future—so great, that the man who finds the way to convert, not eighty or ninety, but even twenty per cent. of the stored energy in fuel into electricity will do more for human civilization than all the inventors of all the marvelous applications of that force, put together, have done since electricity was discovered.

Present indications point to the voltaic cell as the probable means of attaining this result. Not to a cell consuming zinc, of course; for electricity thus produced is about twenty-five times dearer than that obtained from the steam engine and dynamo; but to a cell directly consuming carbon, not by hot combustion, but by cool, chemical combination with the boundless store of oxygen in the air. Carbon is cheap, and air is cheaper; and if they can be made to combine at low temperature by means perhaps no more costly than the grate or furnace in which we make them unite at high temperature, then we shall get very much more than ten per cent. of the available energy. It is not necessary to seek any further reason for the end of the reign of steam. When people can get a machine which wastes even eight, or seven, or six dollars out of ten, they will no longer use an apparatus which wastes nine.

Of course we can cheapen electricity now by driving our present dynamos by wind power or by the natural fall of water when circumstances will permit; and, in fact, we have already set the Hercules of Niagara to spinning the electrical distaff; but what we most want to know is how to consume carbon directly in the cell. Not necessarily hard carbon, but any form of that universal material. We are turning into the rivers from this great city, for example, millions of tons of sewage rich in hydrocarbons and organic substances. Theoretically that refuse, which is not only waste, but pernicious, can be burned in the cell to make the electric current, and the electric current therefrom can be accumulated and used for any purpose. Who will find the way to do it?

All along the frontier of the science open innumerable paths with endless vistas fascinating in their invitations to the student and to the inventor. Even in the oldest of our electrical marvels (the telegraph) the possibilities are still wonderful. A pen, guided in Chicago, will now write in New York the autograph of the operator, so that a bank might safely pay the check to which it is appended. We are multiplying the number of dispatches which can be sent simultaneously; and we are rapidly approaching the time when unlimited messages can be transmitted at perceptibly the same instant in opposite directions over a single wire. We have contrived systems of communicating time which will possibly enable a thousand clocks at once, distributed all along the continent, and perhaps from one end of the world to the other, to work in synchronism and with a current less than is required for ordinary telegraphing. Whether this will result in the establishment of absolute time throughout the world and the final deposition of the sun as a timepiece remains to be seen. We have found substances which are so sensitive to light that they will modify an electric current in accordance with the intensity of the light gray which strikes them—and there is the germ of the picture-telegraph. Before the next century expires, the grandsons of the present generation will see one another across the Atlantic, and the great ceremonial events of the world as they pass before the eye of the camera will be enacted at the same instant before all mankind. The use of the high-frequency electrical current, with possibly screens from outside inductive influences, is believed by many to offer at last a solution to the difficulties which prevent telephoning over long submarine cables. If this be realized, and with the transmission of images and possibly of colors over the wires likewise achieved, then the nations of the earth will indeed stand face to face and speech to speech.

Meanwhile, not only will the electric motor supplant the iron horse, but also the patient steed of flesh and blood; and our descendants, whirling in their electric carriages, over perfectly built speedways at a mile a minute, may wonder at the slowness of that ancient generation which was content to crawl behind the leisurely trotter. Electricity will reduce our metals from the ores and melt them at far higher heats than we now get in our furnaces. What chemical affinities it may unlock, what new substances it may bring to light, no one can imagine. We shall have fireless dwellings, for the electric current will cook the dinner and warm the houses. It will steer our vessels, it will propel them, and it may render possible not only communication between them, but communication from the land to any vessel, no matter where she is on the broad ocean. It will light the unmarked roads of the sea so that a ship may find her way as easily from port to port as a carriage threads its path along the avenue of a city.

Of the electric light, even as we now know it, the possibilities are by no means exhausted. Last summer an arc light on the summit of Mount Washington flashed signals over more than one hundred miles, and this far

from the most powerful form of the apparatus; for the new French reflector is twice as large and has a luminosity of two hundred and sixty-seven million candles. Such a light as this can project illuminated letters, for example, upon the clouds, which can be read over an immense expanse of territory. It has already been suggested that the inhabitants of Mars are trying to communicate with us by triangular signals of presumably electric light; and it is estimated that a blazing signal six miles in length on the earth's surface would be clearly visible to the Martial people. If this be the fact, a row of powerful search lights, extending along some mountain plateau where the air is clear, intermittently extinguished and lighted all at once and at definite intervals (chosen perhaps in some mathematical relation one to the other, which would of itself attract attention) might establish the long-sought communication with our sister world.

Meanwhile, as Dr. Gilbert pointed out three hundred years ago, "the earth is a huge magnet." It has its field of force or magnetic atmosphere and its electrical atmosphere wherein magnetic and electric storms rage. On its surface are the so-called "equi-potential planes" between which the earth-currents flow; and the time is not far distant when we shall utilize these natural currents which now merely act to disturb telegraphic communication. But more strange than all is that which is now to be told.

Every part of space is filled with a fluid called "ether"—infinitely thin and infinitely elastic. In it the particles of what we know as "matter" are in constant motion, ceaselessly hammering one upon the other, and keeping up an eternal bombardment in every direction. There are no forces known to us equal in magnitude to those with which these infinitely small masses pound and strike; but their energy is exerted in all directions, the force of the particles moving in one way neutralizing that of others moving in a different way, and therefore our senses do not perceive the result of this tremendous work. If, however, we can direct these particles to move in the same direction (not generating any new force, be it observed, nor evolving unknown powers, Keely-motor fashion, out of nothing), but merely changing the direction of the force produced by the movement of these particles—in other words, "if we can guide the ether-storm"—then, as has well been said, "we shall hook our machinery to the machinery of Nature," and handle forces so vast that the mind now quails before the effort to conceive them.

Years ago a current of electricity directed into a partially exhausted glass receiver caused the few gas molecules which were left in the vessel to move in streams in the same direction, to bombard surfaces of carbon or platinum and to produce beautiful effects of radiance. The electrical discharge of to-day, in the hands of Nikola Tesla, has been made to alternate (swing to and fro) at the rate of hundreds of thousands of vibrations per second, producing in the ether not a storm but a hurricane; such blasts that partly exhausted tubes brought into their path glowed without apparent cause. Long wires stretched across the room blazed, and from the terminals of the apparatus burst forth great white, ghost-like streams—true flames, yet without heat, and in which nothing was burned. Standing in this electrical pandemonium the experimenter received charges which would be certain death did not their own rapidity of change neutralize their effects too soon to let them kill; the electrical lamp connected to but one wire, and with no return conductor or circuit, flashed into brilliancy in his naked hands. The mysterious flame within a partly exhausted bulb, recognized his presence, and moved from him as if to escape; and not merely this, but disappeared at the clinching of his fist, or followed the motion of his finger. This is not claptrap "wizardism" of the stockjobbing order, but the result of a long and skillful questioning of Nature which at last is beginning to reveal to us "Ariel and all his quality."

And what more is it leading to? What is this marvelous atmosphere of energy in which we are immersed, in which we live, and which, if not allied to life, at least controls life? How far is this already an unknown medium of communication between us? How far is it the medium of communication of that silent language of the lower created things? How far may it be made a medium of communication between ourselves by merely producing electrical disturbances in it, which in turn may be recognized at far-distant points, so that thus waves of regulated intelligence may be set flowing throughout the world? If vibrations can be transmitted to this ether from one source, why not from another? And so why may not the molecular vibrations of the brain, "the maddening mechanism of thought," set, through the ether, a second brain into corresponding vibration? Does then the ether convey thought, or can electrical vibrations be the means of making it do so? If light vibrations can travel from star to star throughout the universe, will thought vibrations do the same?

Again, there is a great deal to be learned concerning the physical effects of these currents of enormous pressure which change with such inconceivable rapidity. At one moment, the body is exposed to a discharge that would produce instant death were it not for the fact that the bolt is no sooner hurled than it is thrown back again. ut suppose that the bolt is not hurled back, and suppose, furthermore, that it be projected by still higher manifestations of energy than these which we have been able so far to direct—then what? Conceive the possibility of creating an invisible field in which every human structure entering it would meet with destruction and every living thing, death. Conceive how utterly puny would become man's present armament should he learn thus to handle the invincible weapons of Nature.

But this is merely speculative, and perhaps, for many tastes, a little too much so. The transmission of intelligence between points not very far distant without wires and by the aid of the high-frequency current is much nearer the realms of possibility, and perhaps will be realized before long. So also are new developments in electrical illumination. Light is merely an ether vibration of a definite rate per second, and electricity, likewise an ether vibration, is closely akin to light. When we can electrically produce ether vibrations of the same frequency as light, then we shall make light; for when such vibrations strike our retinas, we shall see.

Nor is this all. The fiat of the Almighty was, "Let there be light." When we are are able to set the molecules of matter quivering and vibrating at the speed which they assumed in the beginning in answer to that command, when that pure, cold radiance blazes forth under our hands (as some day it will do), then we shall know that of his infinite wisdom we have attained—not quite as much as has the glowworm which we tread upon.

NEW YORK CITY.

THE TELEGRAPH.

BY A. B. CHANDLER,
PRESIDENT POSTAL TELEGRAPH COMPANY.

The progress of the electric telegraph, after its introduction in this country, was slow, and the ultimate success of the improvement seemed doubtful. The first line was constructed in the spring of 1844 through aid furnished by the Government, and ran between Washington and Baltimore. The result of this experiment was not at all satisfactory, and the Postmaster-General in his report for the following year stated that he did not think, under any rate of charges, the enterprise could be made to pay. It is quite possible if the enterprise had been very successful the Government would have assumed control. The experience of that time justifies the opionion now held by far-seeing business men that such schemes can be much better carried on by private parties than by the Government.

But after the failure of the line between Washington and Baltimore, capitalists were very slow to invest their money in the new scheme. It was very difficult to obtain funds wherewith to build new lines, but gradually lines were built in different parts of the country between the more important cities, independent of each other and without any plan of co-operation. In 1851 there were about fifty separate telegraph organizations in the country, each covering very limited territory, a few of which, in the fall of that year, were consolidated, thus increasing their facilities, lessening their expenses, and enabling them better to serve the public. But the system was very incomplete, the methods of transmission very imperfect, and the manner of conducting the business very unsystematic and crude. Owing to the separate companies it was necessary to copy and retransmit messages at the terminus of each line, all of which took time and was frequently the cause of errors. Rival lines which were established between the same points increased the expenses, without increasing the business, and eventually, when still other rival lines were started, each one was operated at a loss. Business men saw that the telegraph would never be a great success, either for the companies or the public, until further consolidation took place, and all the interests were merged in one organization.

The property out of which the Western Union Telegraph Company was first formed was originally organized as the New York and Mississippi Valley Printing Telegraph Company, on the first of April, 1851, for the purpose of building a line from Buffalo, N. Y., to St. Louis, Mo.

On the thirtieth of March, 1854, they purchased the lines of the Lake Erie Telegraph Company, extending from Buffalo to Detroit and from Cleveland to Pittsburg; and, on the twenty-ninth of April, 1854, secured the control of the lines of the Cleveland and Cincinnati, the Cincinnati and St. Louis, and the Ohio Telegraph companies. They also obtained an important interest in the New York and Erie, Cleveland and Pittsburg, and Cleveland and Zanesville lines; and, in September, 1855, consolidated those of the Erie and Michigan Company, extending from Buffalo to Milwaukee. During that year they constructed lines from Cleveland to Chicago, and from Toledo to Grafton and Detroit; and, on the thirteenth of February, 1856, acquired the control of the lines of the Ohio and Mississippi Telegraph Company, extending from Cincinnati to St. Louis.

On the fourth of April, 1856, by act of the New York Legislature, the name of the New York and Mississippi Valley Printing Telegraph Company was changed to that of the Western Union Telegraph Company. On the twenty-fourth of May, 1856, this company acquired the Pittsburg, Cincinnati and Louisville lines; on the seventeenth of July, 1857, the Southern Michigan line, and on the twenty-fifth of December, 1863, the New York, Albany and Buffalo lines; on the fifteenth of April, 1864, the Atlantic and Ohio lines; on the seventeenth of March, 1864, the Pacific Company's lines; on the eighth of August, 1864, those of the Allegheny Company; and on the twenty-ninth of August, 1864, the line of the Ithaca Company.

In April, 1866, the lines of the United States Telegraph Company were consolidated with the Western Union. That company was organized in 1863, and constructed a system of rival lines embracing sixteen thousand miles of wire, and covering considerable portions of the territory occupied by the Western Union and American lines. The United States Company, however, under the most vigorous administration, with all of its lines new and worked to their utmost capacity, was unable to meet its current expenses—the net loss, during the last year of its operation, amounting to an average of more than ten thousand dollars per month.

On the first of July, 1866, the lines of the American Telegraph Company were consolidated with those of the Western Union. That company—chartered by the State of New Jersey—was organized in 1859 by a consolidation of the lines of the American Telegraph Company of New York, the New York and Washington House Printing, the Magnetic, and New York and New England Union. It also acquired possession of the Maine, New Brunswick, Nova Scotia, Troy, and Canada Junction, Long Island, St. John and Fredrickton, and Richmond, Charlotteville and Staunton lines; and subsequently those of the Cape Cod, Cape Cod Marine, Vermont and Boston, Lynchburg and Abingdon, East Tennessee, Delaware, and Hudson, Philadelphia and Wilkesbarre, Susquehanna, Baltimore and Ohio, Washington and New Orleans, and Southwestern Telegraph Company's lines. The American Company, in short, had followed in the Eastern and Southern sections of the country, a similar course to that pursued by the Western Union Company in the West; and by purchase, consolidation, and construction, controlled lines extending throughout the Atlantic Coast and the Mississippi and Ohio Valleys.

On the first of June, 1867, the Western Union Company absorbed the lines of the California State Telegraph Company; on the first of July, 1867, those of the Illinois and Mississippi Telegraph Company; and on the first of April, 1868, those of the Chicago and Mississippi Telegraph Company. When the telegraph lines were being built in the Far West very little annoyance was experienced from the Indians; but when the red men discovered that, by means of the wire, communication could be had with the soldiers, they took every opportunity to destroy the lines. This condition of affairs was especially unpleasant for the telegraph operators who were located in that section, oftentimes being stationed many miles from a human habitation, and always at the mercy of the Indians. As a consequence many of the stations in this part of the country were abandoned until after the opening of the Pacific railroads, when the offices, transferred to the line of the railroad, were reopened.

Considering the number of years that have elapsed since the practical application of electricity to telegraphic uses, there have been comparatively few improvements as to foundation principles in the instruments used and the methods of transmission. The first successful experiments in electrical transmission, by Professor Morse, were made in 1832. Twenty years later Moses G. Farmer, of Salem, Mass., devised the synchronous multiple telegraph, the first multiple system invented. The duplex system, according to its name, nearly doubled the capacity of telegraph lines. This was in operation in 1872, and by its means messages could be simultaneously transmitted between distant points, in both directions. In 1874 Edison discovered and applied a plan of transmission by which two messages were sent in the same direction, simultaneously, over the same wire, and, applying to this the principles of the duplex, formed the quadruplex, now extensively in use. Later, we have had the multiple harmonic system, by which a number of messages can be transmitted in one direction, or in opposite directions. The automatic system of transmission has been one of the most remarkable improvements connected with telegraphy, and by this system a speed is attained of from 500 to 800 words a minute.

About ten years ago the Postal Telegraph Company made an effort to introduce the automatic system of Leggo, by which it was claimed several thousand words a minute could be sent over a single wire. The experiment, however, altho successful under favorable conditions as to telegraphic transmission, proved a failure in practice in the handling of commercial business.

The idea of telegraphing from moving trains was suggested in 1853, but was not attempted until 1888. The instruments in the car are so arranged as to make a circuit between the roof of the car and the earth. The operator in the car holds in his lap an induction coil mounted upon a small board, uses a telephone and a hand-case containing a few small cells of battery. Altho the feasibility of transmitting communications under such conditions is interesting, and even more astonishing than that of ordinary telegraphic service, it has never come into use to such an extent as to serve a practica purpose.

The typewriter was first introduced into the office of the

Associated Press, in connection with its telegraphic reports, about nine years ago. During the past three years it has come into extensive use by the Postal Telegraph Company and the Commercial Cable Company. An expert telegraph operator can send about forty words a minute, while a man cannot write with a pen for any length of time more than thirty or thirty-five words a minute. In New York, the press service requires from twenty to thirty copies of every dispatch. These were formerly made with a stylus on tissue paper, interleaved with carbonated sheets. It required considerable labor to press through so many thicknesses of paper, and many operators broke down under this strain of work. On a typewriter a speed of seventy words a minute is easily acquired and maintained. There is no cramp, and little fatigue in the operation, for eight fingers do what was formerly done by two. The Postal Telegraph Company began using the typewriter in its offices on the Pacific Coast, and afterward introduced the machine into its New York office. Some alterations and improvements have been made in the typewriter in adapting it to telegraph use, and all these improvements have grown out of practical experience. For press work, where a great many copies of each dispatch are required, a brass cylinder is used instead of a rubber roller. This gives a hard surface for the type to strike against, and the thirty-fifth copy is nearly as plain as the first. The paper used for press dispatches is very thin, and is cut in sheets about twelve or fourteen inches long. It is kept even and level by means of a feed-guide made of japanned tin. A larger style of type is used than in the ordinary machines, and some additional symbols are introduced.

The telegraph service has given employment to a vast number of women, and it was stated some time since, in a New York journal, that the only two female train dispatchers in the world are connected with New England railroads. They are expert telegraphers and, in fact, are said to be unequaled in their profession.

The business affairs of a telegraph company are generally managed by an executive committee, chosen by the Board of Directors, consisting of the President, Vice Presidents, General Manager, Treasurer, and sometimes other executive officers. This committee controls the appointment and rate of compensation of all employés and maintains a general supervision over every department of the service. The teritory is generally divided up into different sections, or divisions, each division being under the control of a General Superintendent.

The divisions are subdivided into districts, each being in charge of a District Superintendent, who is directly responsible for the maintenance of the lines, which are kept in order by a large number of repairmen; and also for all details of the operation of the lines and conduct of the business in the offices.

Each station is in charge of a manager who reports to the District Superintendent to whom he is accountable. The District Superintendents report to the General Superintendents, and the later to the General Manager. At the beginning of each month each office sends a report to the District Superintendent showing the number of messages sent and received, the gross receipts, the amounts received on messages for each office with which business was done, the expenditures in detail, etc. The District Superintendents after carefully examining the reports, and, if need be correcting them, and approving the vouchers, forward them to the Auditor for final examination, comparison and record. All disbursements for the construction or maintenance of the lines are made by the District Superintendents under the supervision of the General Superintendents. Material and supplies of every description for constructing and operating the lines are purchased under the supervision of the General Manager, and are disbursed by the Supply Department on requisitions of the Superintendents after approval in the executive office.

At the end of every year the General Superintendents prepare reports, showing the amount of construction, reconstruction, and repairs required in their respective divisions during the ensuing season, together with the estimated cost. These statements are classified as positively, probably and possibly necessary, and form the basis for determining the amount of material and supplies required.

Last year (1892) the Western Union Telegraph Company sent 62,387,000 messages, and its earnings were $23,706,000. The Postal Telegraph Company sent 9,335,000 messages, and its earnings were $3,187,000.

NEW YORK CITY.

THE OCEAN CABLE.

BY GEORGE G. WARD,
VICE PRESIDENT AND GENERAL MANAGER COMMERCIAL CABLE CO.

The first point of interest connected with the subject of the ocean cable is its manufacture. The foundation of the cable is a conductor composed of seven fine copper wires, which, when rolled together, are about as large as a piece of common white twine. This conductor is drawn through a machine and covered with a mass of sticky compound for the purpose of compelling a coat of gutta-percha, which is next applied by another machine, to adhere to it. It is considered so necessary to prevent bubbles of air in the interstices between the strands or between the conductor and the gutta-percha envelop, that four of these coatings are placed upon it, when it is declared to be insulated. The copper wire and gutta percha together are called the "core." The manufacture of the cable is really now complete, because everything else that is put on to it is only done for the purpose of making it strong and to protect it from damage.

The "core" is now covered with jute, the jute is covered with tarred tape, and then the sheathing wires, or armor, are applied for further strength and protection. Another serving of jute and tarred tape is then applied, and if it is necessary to strengthen it still further another sheathing and another serving of jute and tarred tape. Then the cable is tested by means of certain fine instruments and afterward coiled into large circular tanks, where it is kept in water for a time and afterward subjected to more electrical tests. These tests are made for the purpose of discovering whether the cable has been made according to specifications and whether it will properly perform its work.

As a rule, it must be understood that a cable is manufactured in various sizes or types, some being stronger than the others. The largest size is used near the shore, because there is found the most movement. It may be said generally that there are three sizes of ocean cable. The smallest is about an inch in diameter; the intermediate size, which is placed where the water begins to get shallow, is nearly two inches; and the largest size two and a half inches. The largest size is used nearer the shore because it is less liable to be injured, and also because the water is shallow. The maximum of movement is in the shallowest water, and the movement decreases until you get to the greatest depth, where there is no movement at all. Consequently the cable used in the deep sea, where there is no movement, is of the smallest type. When we get nearer the Fishing Banks off the coast of Newfoundland, where the water suddenly shoals in a great many places, there we put in an intermediate type, so that if a schooner should foul us with her anchor the cable would not break under the strain of raising it to the surface.

This matter of anchors, by the way, is a prolific source of injury to ocean cables. When an anchor gets entangled in one of them a fisherman has much difficulty in bringing both the anchor and the cable to the surface, and when he gets them to the surface they are difficult to disentangle; very often he solves the proplem by simply cutting the cable, thus causing a great deal of trouble and expense to the cable company. Some years ago I had the honor of being instrumental in obtaining an agreement from all the cable companies that they would pay fishermen for the loss of an anchor rather than have them cut the cable. A fisherman is, of course, compelled to describe the location of his boat at the time that he ran foul of the cable. If he testifies that he lost his anchor, broke a rope or chain, we pay the cost of the damage. The willful breaking of a cable is now made a crime under international law, and is punished by fine and imprisonment.

After the cable is made it is shipped on board the cable steamer. There are now thirty-seven cable steamers in the world, the gross tonnage of which is about 54,600 tons. The steamship "Faraday" was built especially for this kind of service, as also was the "Mackay-Bennett," which is the repairing steamer of the Commercial Cable Company, and a number of others have been specially constructed. The "Faraday" is 4,916 tons and has laid several of the Atlantic cables. The "Silvertown" is also a large ship which has done a great deal of work on both coasts of South America, and on the west coast of Africa. The "Mackay-Bennett" was built of steel at Govan on the Clyde in 1883, at a cost of $320,000. Her gross tonnage is 1,700. She is propelled by twin screws, driven by independent sets of engines. Each engine is fitted with Brown's patent hydraulic reversing gear. Her speed is 12 knots an hour, and her coal capacity 750 tons. She has three tanks in which she can store and carry altogether 385 nautical miles of submarine cable. She is fitted up with all the modern machinery for grappling, picking up and paying out cable. She is lighted throughout with electricity, so that cable operations can be carried on during the night. She is steered by steam. Her maneuvering qualities are excellent. She can turn in her own length, and can be held close in shore if the nature of the operation in hand demands it. Steadiness is secured by bilge-keels. A bow rudder enables her to steam astern. She carries a steam launch, and the latest and best navigational aids.

A new feature in connection with cable ships is an apparatus now used on the "Mackay-Bennett." It is called the "marine sentry." The primary object of this machine is to supply an automatic warning of the approach of a ship to shallow water, and thus to prevent the danger of stranding, which is frequently the cause of accident to sea-going vessels.

The principle part of this contrivance is the "sinker," which can be towed steadily for any length of time, at any required vertical depth down to forty-five fathoms; and should it strike the bottom through the water shallowing to less than the set depth it will at once free itself and rise to the surface simultaneously, sounding an alarm on board, thus giving instant warning on the bridge, of danger, and in ample time to avert disaster.

The captain of a cable steamer is specially qualified in engineering, and there is always on board an electrician whose business it is to test the supply of cable that is kept on board for the purpose of making repairs. If the ship is engaged in laying a new cable he keeps testing it constantly, so that if there should be a fault in the cable his test will show it the moment that part of the cable containing the fault strikes the water. Aside from the ordinary sailors, there are also employed on board the ship a few men who are especially competent in handling cables, coiling them in the tanks, etc.

The ship is also supplied with elaborate and complicated machinery for this work. There is what is called a sounding machine used for the purpose of submarine surveying. Before the invention of this apparatus hemp lines were used for sounding. It was necessary to use a weight of about 450 pounds to keep the line vertical, and it took about three hours to make a sounding in a depth of 2,000 fathoms. In this machine a sinker made of pianoforte wire is used, weighing about fifty pounds, and the depth just mentioned can be reached in twenty-two minutes. The weight is detached automatically and is left at the bottom, the depth being indicated by a tube, which is attached to the wire and brought to the surface after the sounding is made.

There is also a machine for paying out the cable. The cable leaves the ship at a regular rate of speed which can be controlled by this machinery, and there is no "pull" or strain upon it. There is a dynamo meter which registers the strain as the cable is being paid out. In the laying of the cable the shore end, which is the heaviest part, is usually brought from the ship, which lies in the offing, to the shore on a raft which will float close up to the beach. Then a sufficient amount of the heavy shore end is laid in a trench and carried up the beach above high-water mark. On the shore it is coiled several times around a huge post. The machinery, of course, is worked by steam, and as the cable leaves the stern of the ship air balloons are attached to it at intervals of fifteen or sixteen yards. These are used for the purpose of floating the cable, and to prevent its being damaged by rocks in case it was simply dragged to the shore. Under this arrangement, also, if there is a cross current, or tide and the cable sags, it can be readily straightened by stopping the paying out. After the end is fastened to the shore the raft puts out and lays the cable between the shore and the ship, or as far out as it is considered desirable to lay this heavy type of cable. The end of this shore part of the cable is then carried on board the ship and spliced to what is called the intermediate size. Then the ship continues on its journey to sea and pays out this intermediate size.

A similar operation occurs at the other end of the line. When the ship has arrived at some distance from the shore she buoys the cable she has been paying out, unloads the other shore end on to the raft, which proceeds to the beach, and repeats the same operation that it did at the beginning. The laying of the cable is now completed. It may be said that the cable is led from the beach into a small house known as the cable "hut," which is made of galvanized iron, and is fitted up with testing instruments, which are always kept there ready for use. This hut is built by the men on board before the laying begins. These huts are usually placed on a prominent point of land, and from there the cable is carried to some available building site, where a large station is built. In these stations there are accommodations for from fifty to a hundred men and their wives and families. Most of the cable stations on the shores of the Atlantic are in out-of-the-way places; frequently the only inhabitants for miles around are those of the cable station. The main cables of the Commercial Cable Company land at a place called Dover Bay, on the coast of Nova Scotia, where they are brought up into the hut, and so led on into a trench through bog and marsh to a point called Hazel Hill, seven miles distant, where the officers reside.

We have a hut on Coney Island at the rear of the Oriental Hotel, that would be used in case a fault should occur between Wall Street, New York, and that hut. In such an event it would be necessary to cut the cable at that point, so as to be able to manipulate it between New York and the hut.

Ocean cables very rarely have to be repaired, except for a mechanical injury. They do not wear out; in fact, the longer gutta-percha is submerged the better it is, and hemp is practically indestructible in salt water. The iron which forms the sheathing sometimes corrodes slightly where the bottom of the Atlantic is unfavorable to it. Fish, at the bottom of the sea, do not interfere with cables; but in the warmer climates there is a peculiar species of boring fish that has developed a great liking for gutta-percha, and has already destroyed several cables. It is a very small fish, but, like moth, capable of doing a vast amount of damage.

When cables get out of order, it is necessary, before the cable ship starts out, to determine the position of the fault or break. It does not follow that a cable must be broken, that is, entirely ruptured, before its working is stopped. Any little aperture, no larger than a pin's head, leading from the outside sheathing through the insulating material up to the copper core will cause a fault, and prevent the working of the cable. Of course, when the fault is serious enough to stop the working of the cable, we would very much rather it would be a total fracture than only a partial one. As I say, before

the ship starts out it is necessary to determine the position of the fault—*i. e.*, how many miles from the land. This information is gained by the application of a scientific formula, which it would not be interesting to describe in detail. It is first necessary to know what the resistance of the cable was when in perfect condition. The resistance of the conductor of a cable varies according to its length; if the fault occurs midway, of course the resistance will only be one-half as much as for the complete cable. "Resistance" is the technical word for the obstruction, which the conductor offers to the passage of an electric current. The unit of resistance is called an ohm, and the resistance per knot of an Atlantic cable is about three ohms. Therefore, if the cable is broken 150 miles out, the test will place the fault at three times 150, which would be 450 ohms.

Having determined the distance of the fracture from the shore, the repair ship is instructed to proceed to sea, recover the broken ends, and join them together. The captain of the ship is provided with a chart on which is marked the exact location of the cable along its entire bed in the Atlantic. It shows him precisely the character of the bottom of the ocean where the cable is laid, and is of invaluable assistance in determining the proper methods of recovery. He therefore proceeds to the point which his navigating instruments indicate to be the right spot, but before commencing operations he will first assure himself, by making soundings, that he is in the proper location.

The method of recovering the cable is to throw out an iron instrument with several prongs at the end of it, called a "grapnel," and drag this along the bottom of the ocean in a line at right angles to the cable. He commences this work at a sufficient distance beyond the break so as to give him enough slack end, thus preventing the cable from slipping off the end of the grapnel; he probably goes from half a mile to a mile beyond the point where the fracture is supposed to have occurred. The cable is then hauled up on deck.

The interesting point in connection with the use of electricity on the ocean, is a scheme suggested by Prof. W. W. Jacques in regard to signaling between vessels. The principal involved is not entirely new, and experiments in ship signaling have, it is said, demonstrated its feasibility. He pictures two ocean greyhounds approaching each other with a combined velocity of 40 miles an hour, through a heavy fog. The lights are useless even on a dark night, for in foggy weather even an electric search light will not be visible a mile away. The steamer's whistle is useless, for the fog soon absorbs the sound. Yet altho the vessels may be approaching each other with a force that, in case they meet, shall mean total annihilation, there is no danger if the ships are already fitted with electrical signaling apparatus. Thus provided, the ships will signal to each other when miles apart.

Professor Jacques proposes to equip each vessel with an insulated wire running from bow to stem, but dipping into the ocean at each end. In connection with this wire, one vessel is provided with means for producing strong and rapidly alternating currents of eletricity, and the second vessel has its wire connected to an ordinary telephone. Electrical undulations will be radiated from the first vessel through the water in all directions, until, reaching the second vessel, many miles away, they will be heard in the telephone. With the telephone can be connected an alarm-bell so that any sound received will automatically call the notice to the attendant. By thus equipping each vessel with means for sending out electrical undulations, and for listening for any that might be received, each vessel would be made aware of the approach of the other, and the danger of collision would be avoided.

Cable dispatches are generally received at the rate of twenty to twenty-five words a minute, but on special and urgent occasions, some very quick service has been rendered. Two years ago the observatory of McGill University conducted some very interesting experiments, preparatory to making connection with the Royal Observatory, at Greenwich, so as to determine the exact longitude of Montreal, and other points on the Atlantic seaboard. In order to work out their calculations it was necessary for them to determine the exact time it took for a telegraphic signal to cross the Atlantic. Their observatory was connected over the Canadian Pacific Railway's telegraph, with the Commercial Cable station at Canso, N. S., where the superintendent of the company had arranged an automatic contrivance so that the land line and cables should work into each other.

When this was done a duplex circuit was arranged on both land and sea, between the observatory at Montreal and the Commercial Cable Company's station at Waterville, Ireland. A chronograph was attached to this end of the circuit; and the telegraph signal that was sent from McGill's Observatory to Canso across the ocean and back again, came back to the point from which it started, and was recorded on the chronograph. One hundred and twenty signals were sent through the round circuit of eight thousand miles of wire and cable; and the average time of transmission, from the time that the signal left McGill Observatory until it returned, proved to be one second and five-hundredths. The whole number ranged between the narrow limits of one second and one and one-tenth seconds,

The submarine telegraph system of the world consists of 142,790 nautical miles of cable. Government administrations own about one-tenth of this property, and the remainder is in the hands of private companies. The total cost of these cables is in the neighborhood of $200,000,000. The North Atlantic is crossed by eleven cables, all laid since 1870; five companies are engaged in forwarding telegrams between North America and Europe, and the total length of the cables owned by them, including coast connections, is over 30,000 nautical miles. The following schedule shows the number of nautical miles of cable operated by the Government in the different countries of the world, leaving out fractions: Austria, 97; Brazil, 19; Belgium, 54; Canada, 214; Cochin China, 795; Denmark, 192; Dutch Indies, 488; France, 3,269; Germany, 1,579; Great Britain and Ireland, 1,599; Greece, 459; Holland, 59; India, 1,982; Italy, 1,027; Japan, 55; New Caledonia, 1; New Zealand, 196; Norway, 230; Queensland, 162; Russia in Asia, 70; Russia in Europe, 212; Senegal, 3; South Australia, 49; Spain, 135; Sweden, 88; Tasmania, 4; Turkey in Europe and Asia, 331; Victoria, 4. In addition to these there are twenty-five cables owned by private companies, their total length being 129,407 nautical miles.

TELEPHONY.

BY HAMMOND VINTON HAYES,
ELECTRICAL ENGINEER OF THE BELL TELEPHONE CO.

It is a safe rule to give, that no invention is perfect and complete unless it is simple and has been freed from all complicated mechanism. Probably the best exemplification of this rule is the speaking telephone, which cannot fail to be placed at the head of the inventions of this inventive century. This invention, which rendered it possible to transmit and reproduce with perfect accuracy the human voice with all the complicated sounds and tones which constitute speech, was a marvelously simple combination of a magnet, a coil of wire and a piece of soft iron. Moreover, this same combination, in almost the exact shape in which it left the hands of the inventor, has remained the standard telephone used throughout the world from the time of its invention to the present day.

The full value of this invention, as a means of communication was not at first apparent. It was considered a wonderful scientific instrument, but commercially useful only for communication between points closely related. A second invention was needed to demonstrate to the world the vast usefulness of this little instrument.

This second invention, known as the microphone, instead of obtaining its energy from a magnet, as was the case in the magneto telephone, made use of a primary battery and, by a special arrangement of its parts, produced fluctuations in the electric current similar to those produced by the magneto-telephone. By these means it was possible to obtain a much greater volume of transmitted tone and so to demonstrate that the telephone was no toy, but could be used as a means of communication between points separated from each other by some considerable distance.

In the first microphones, the variations in current required to produce speech were derived from a single variable contact between two points in the electrical circuit. For electrical reasons it was necessary to use a comparatively weak battery current between these contacts and to speak to the instrument in a subdued tone of voice. As the distance increased over which it was desired to speak, more powerful transmitters were required. Such transmitters were obtained by using, in place of the single variable contact, a very large number of such contacts. In the transmitters used on very long lines to-day, a mass of finely divided carbon is employed. These carbon particles are contained within the transmitter in a little case, the size of a small pill box. This case has flexible ends, and the current from the battery passes between the two ends through the granulated carbon. When the ends of the box, acted upon by the voice, are made to approach or recede from each other, the pressure upon the mass of carbon is varied, thereby changing the resistance offered by the carbon to the electric current passing through the instrument, and causing the fluctuations in current needed to reproduce speech. An instrument of this kind can be operated with a powerful current as compared with the single contact microphone, and as it can be operated by a powerful voice, is capable of being used on the longest circuits.

Powerful transmitters and good magneto-receivers were not alone sufficient to widen the limits of telephone transmission. A third invention was needed—an invention to improve the conductor over which the telephone message was to be sent. Soft copper wire had been tried in the earliest days of telegraphy, but had not the strength necessary to support itself. Iron wire, which had been used for short telephone lines, could not be successfully used on long lines as, owing to its magnetic properties, it tended to render transmission weak and indistinct. The new invention consisted in giving to copper wire, which already possessed most decided electrical advantages, mechanical strength sufficient to make it not only self-supporting, but strong enough to withstand the strains to which wires are subjected from wind and snow. The diameter of the wires used on long-distance circuits have varied with the length of the circuit from about one-tenth of an inch to one-sixth of an inch.

When the limits of telephony began to be extended, it was found that the service over a single wire connecting two sets of telephones was unsatisfactory. This was due to the fact that electric disturbances were introduced upon the wires, producing buzzing and crackling noises in the telephone sufficiently loud to render transmission difficult if not impossible. It was found that this difficulty could be overcome only by using two wires to connect the telephones together. Nor did these two wires for each circuit, technically known as a "metallic" circuit, entirely remove the trouble. On long lines the current, used to transmit speech on one metallic circuit, made itself apparent on adjacent circuits, due to a kind of sympathetic action, known as electric induction. To such an extent did this induction take place that what was said on one circuit was almost equally audible on other circuits. Such an action, completely preventing privacy and seriously impairing the efficiency of the telephone service, had to be neutralized. This was accomplished by twisting the two wires of each circuit about one another.

With a magneto-receiver and a microphone transmitter at the two ends of the line, with a circuit consisting of two copper wires twisted about one another throughout their entire length, each of these wires so separated or insulated from the other and from the earth that an escape of the telephone current is impossible, we have the long-distance telephone system of to-day.

There was another problem, which confronted the telephone engineer at the outset and which has increased in magnitude as the telephone business has developed. This problem was how to provide rapid and sure means of connecting together the subscribers to the telephone service. In the early days, when the uses of the telephone were so few that the terminals of all of the wires to the subscribers could be placed in front of a single operator, it was comparatively easy to determine whether or not a desired line was busy and, if not in use, to connect the two lines together. But to-day, where, in a single exchange, there are five or six thousand circuits terminating, and the work of connecting together telephone subscribers must be delegated to a force of seventy-five or one hundred operators, the problem becomes one of extreme difficulty and complexity. Without going into the details of this problem, let it suffice to say that to-day, in the large telephone exchanges, any one of seventy-five or more operators is able, when any one of the five thousand circuits is desired, immediately to determine whether the desired line is already connected to some other line, even tho the connection may have been made by another operator widely separated from the first, and, if not connected, to put the two circuits into condition for communication. When it is considered that this mechanism permits one subscriber to be connected not only with any other subscriber in his own city but with any desired subscriber in another city, hundreds if not thousands of miles away, the magnitude of the problem is apparent and its solution remarkable.

The number of wires which have to enter and leave a large telephone exchange has become so great that it is necessary to bundle them together into cables and to carry them in conduit underground, bringing the outer terminals of the cables from the conduit to some central point from which the wires may be distributed to the several subscribers. These cables contain from fifty to one hundred pairs of wires, each wire carefully insulated by cotton or paper from every other and each pair of wires, forming a circuit, carefully twisted so as to maintain the neutrality to the other circuits, as before described.

The progress which has been made in widening the circle over which the transmission of speech is possible, from the narrow limits of a house at first, to the wide circle of a city, from a city to its suburbs, and of late from one city to another hundreds of miles away, naturally excites the curiosity as to the ultimate limits that can be reached in telephony. The only answer that can be made must be based upon the experience of the past. In the past, it has been found that, whenever a need existed and a way of overcoming the need was desired, men and means were always at hand. If it should be proved that there is a business need for an increased radius to our circle of transmission, even tho the diameter of that circle reached from the Atlantic to the Pacific Ocean, I have every confidence that the means, mechanical and electrical, will be found. That the limits of transmission will be extended across the ocean is likewise not impossible, but the difficulties of the problem to the electrical engineer of to-day seem so great as to be almost insurmountable. He would be a rash man, however, who would assert that no new invention could be made by which such a feat might be accomplished.

As we can claim the telephone as an American invention, so, too, can be ascribed to America the initiative in the development of telephone transmission. The first long-distance lines employing hard-drawn copper wire were constructed in this country, and to-day the longest telephone circuits in the world are in daily use in the United States. The best switchboards and cables employed to-day in most parts of the world are the inventions of Americans.

What has been said applies only to the use of the telephone for exchange purposes on local and long-distance lines. This portion of the telephone business has its special charms both on account of its never-ceasing marvelousness and on account of its unknown possibilities—the marvelousness of being almost instantly placed in communication with a person so far away that days would be occupied on the fastest railway train in reaching him, and the possibility by some new invention of still further widening the circle of transmission.

But apart from the application of the telephone to purposes of communication between points widely separated, there are numerous special applications of the telephone which are equally useful, altho, perhaps, not equally interesting. One of the most recent and interesting special applications of the telephone is its introduction upon the men-of-war of our new navy as a means of communication between different portions of the ship. By the use of specially designed telephones and switching apparatus it is now possible to use the telephone under the peculiarly severe conditions which maintain on shipboard and particularly upon a war ship. With this new apparatus it is now possible for the officer in command of the ship, standing in the conning tower or upon the bridge, to give his directions to any desired portion of the ship with rapidity and with perfect accuracy. The officers' staterooms can be provided with instruments so connected that they may communicate with their special posts. Thus the captain of the ship, without even leaving his berth, can speak with the officer upon the bridge, or the chief engineer may speak from his own room with his assistant on duty in the engine room.

So, too, for communication between the rooms of a hotel, between the several departments in a factory or an office, and for numerous other purposes, the telephone can be and is in successful operation.

In fact, this exquisitely sensitive piece of mechanism can now, in the hands of the telephone inventor and engineer, be shaped to the uses of man, from the powerful instrument needed to transmit speech over great distances to the delicate instrument used in medical and surgical cases.

BOSTON, MASS.

ELECTRIC LIGHTING.

BY NELSON W. PERRY, E.M.,
EDITOR "ELECTRICAL WORLD."

While the general public may imagine, from the number of competing electrical firms in the market, that the different systems of lighting are very numerous, as a matter of fact, for incandescent lighting there are practically but two. One of these is known as the multiple arc continuous current, and the other the multiple arc alternating current system. In the first the current is continuous in one direction and the lamps are tapped into the circuit very much as a number of water-wheels would be tapped into a canal along its banks, each one receiving the same hydraulic head of water and each one being independent of the other wheel.

In the alternating current system the current is no longer continuous but is vibratory in character, changing its direction some sixty thousand times a minute. The peculiar character of this current enables the electrician to change from high pressure to low pressure *ad libitum*, which he cannot do so readily with a direct current. For this purpose an apparatus, known as the transformer, is employed; and it is usual to transmit the current at very high pressure, which is the most economical method of transmitting, and then to use it in the lamps at low pressure which is the most economical method of utilization.

In the direct current system, however, the current must be used at the same pressure at which it is transmitted, and as all lamps are made for the use of the current at low pressure, it must be transmitted at a pressure suitable for their use, which cannot be done economically over long distances. So that the general rule may be laid down that where the distances are great—say over a mile, from that up to any number of miles—the alternating current system is preferred; while for the shorter distances the direct current is almost always universally used. The first electric light introduced was the arc light, which consists of the passage of a current of electricity between two electrodes, slightly separated, the light itself being due to the temperature which the carbons reach, due to the electric arc.

While the arc light was early introduced (being fed from primary batteries) it was not until the introduction of the dynamo that it became a commercial success. To the success of this experiment Mr. Charles F. Brush, of Cleveland, O., has contributed more than any other individual, he being really the pioneer in commercial arc lighting. Since then others have improved on some of his methods. The Brush arc light, however, remains today one of the best, and many of the Brush patents are fundamental, the Courts having ruled in a great many cases that many of the best commercial arc lights of other manufacturers are infringements of the Brush patents. This litigation has been practically stopped, however, by reason of the General Electric Company now controlling the Brush patents, as well as many of the other important patents covering the arc light.

The incandescent light for its luminosity depends upon the heating to a high temperature of a filament or rod of a conductor, due to the passage of a current of electricity. A very thin filament of carbon is now universally used for that purpose. This, if heated in the atmosphere, would cause its combustion at once; therefore, to prevent combustion, it has been inclosed in a globe from which the atmospheric oxygen has been excluded.

As to those who deserve credit for the invention of the first practical incandescent lamp is a question which is now agitating the electrical community. Mr. Edison applied for patents in 1879, and these were granted in the early part of the next year. Afterward, in a litigation with Sawyer & Man, the validity of Edison's patents was sustained by the United States Circuit Court.

But just now a new claimant is in the field with very strong testimony behind him to show that he invented the incandescent lamp and used it in the streets of New York early in the fifties. This is Henry Goebel, a German, who was a watch manufacturer and lived at various times on Grand Street and Canal. During this time, from 1851 or '52, for some fifteen years he exhibited in public a telescope of his own make and, to attract the attention of the crowds, also exhibited, or claims to have exhibited, incandescent lamps, operated by primary batteries, which, according to the testimony, covered every essential of the Edison patent of 1879.

The General Electric Company, which now owns the Edison lamp patents, has been, during the last year, endeavoring to close up all outside lamp manufactories, on the claim that they are infringements of the Edison patent. The last company acted against was the Beacon Vacuum Pump and Electric Company, of Boston, who have made a very strong defense in the testimony of Henry Goebel, the German above referred to, and some sixty or seventy others, who claim to have seen the lamps of Goebel in practical operation long previous to the application by Edison for patents.

If the Edison patents are maintained, the General Electric Company will be able to close up all competing lamp factories, and compel all users of the electric light to come to them for supplies. Not only this, but they have shown an evident intention of selling to no one except to those who use the General Electric Company's machinery. If this policy is followed out, it will give the General Electric Company almost a complete monopoly of the electrical field, to the great injury of the community at large.

Goebel appears to be a very intelligent German. He speaks English somewhat imperfectly, but has the air and manner of a gentleman. Those who have known him in years past, state that he is a thorough mechanic, a glassblower, with some slight pretensions to scientific attainments. If his claims are substantiated it will throw the lamp manufacture open to the public and place it in the same position as any other commercial enterprise. Unfortunately for Goebel he did not patent his invention, and so, if the case is decided against the General Electric Company, it will make the invention public property and the different manufacturers will compete with each other in the open market. The Edison Lamp Works, at Harrison, N. J., which, by all odds, are the largest works of the kind in the world, are still not capable of supplying the demand; and if they should succeed in controlling the lamp manufacture it will undoubtedly work a great hardship to the electrical industry.

As another loophole against the Edison patents, the Westinghouse Company, a competing organization, has gotten out an incandescent lamp which, they claim, does not infringe the Edison patents. This new lamp is known as the separable lamp, from the fact that, instead of being made of a single piece of glass with the filament hermetically sealed into the globe, it consists of two parts: the globe, which is bottle-mouthed, and a ground, glass stopper. The filament fits into this bottle-mouth, and when introduced is hermetically sealed and may be removed in case it breaks and a new one introduced, thus enabling the lamp to be renewed whenever the filament gives out. With the Edison lamp this cannot be done, for when the filament breaks or when, through use, it has lost a portion of its light-giving properties, the whole lamp becomes useless and is thrown away.

In regard to the distance to which the electric current has been transmitted, the most noteworthy experiment was that tried at the Frankfort Exposition in 1891, when the current was transmitted from the Falls of the Neckar, at Lauffen, to Frankfort-on-the-Main, a distance of 108 miles, where it was employed for pumping water for an artificial waterfall, and also for illuminating a bank of incandescent lamps, the loss in transmission being only 25 per cent.

In this country I think the greatest distance to which it has been transmitted is about twenty-five miles. As already intimated, it is necessary to use high pressure, in order to transmit the electric current economically to long distances. The difficulty in using high pressure is insulating the wires so as to prevent leakage of the current from the wires to the ground. In the Frankfort experiment, just referred to, they used a pressure of some 16,000 volts, and until the experiment was tried, it was not known what effect it would have upon insulation, it being feared that the insulation would not stand such high pressure. It, however, met the requirements much more fully than most people had expected, and instantly demonstrated the feasibility of high potentials up to that point. Electricians are now considering the feasibility of using potentials up to hundreds of thousands of volts. With the potential of 100,000 volts the power of Niagara could be transmitted to Chicago, with a loss not exceeding 20 per cent., and it could be sold at that place in competition with steam power, probably to commercial advantage. In the Frankfort experiment they transmitted 100 horse power from Lauffen to Frankfort, a distance of 108 miles, with a loss of 25 per cent. in the transmission. That experiment may be said to be the most important that has ever been made in the transmission of power at long distance, and it demonstrated beyond question the practicability of schemes of this kind. It also settled many questions which, up to that time, had rendered the outcome in such attempts exceedingly doubtful.

There have been no improvements in electric lighting, except in matters of detail in the incandescent lamp, for ten years. But the experiments Mr. Nikola Tesla is making with high potential alternating currents of extreme rapidity have opened a very wide field for research in electric lighting which may in time result in discoveries of the utmost importance.

It is known that the argand burner gives considerably less than one per cent. of its energy in the form of useful light rays. Every 99 per cent. of the energy liberated by the combustion of the gas are given out as heat rays, and are totally useless for illuminating purposes. On the other hand, the firefly or glowworm gives a light practically without heat; and, in this case, over 99 per cent. of the energy expended is given out in light rays and but a small fraction of one per cent. is lost as heat rays.

Now it is known that light, heat and electricity are different phases of the same phenomenon—viz., the vibration of the universal ether. They differ from each other only in the rapidity of their vibrations. Now if we can produce electrical oscillations of any desired rapidity, and those alone, we could generate electrical oscillations of that rapidity which correspond to and produce the phenomena of light. Our present methods correspond very much to a supposed situation where, on an organ, for instance, in order to strike a high C, it became necessary for us to press every note on the keyboard, from the lowest note up to high C. In this way it is obvious we would have to utilize an enormous amount of air before producing a very small amount of desirable note. On the contrary, as a matter of fact, we merely press a single key—*i.e.*, high C—and, with a very little expenditure of energy, we have the note desired.

Now, theoretically, it is possible to produce those light vibrations without the non-luminous heat vibrations and therefore to produce a light which is without heat, and therefore without the useless expenditure of energy for the vibrations which are of no advantage to us whatever. Mr. Tesla's experiments have been in this line. While he has not attained to the theoretical point referred to, by a long distance, he still has obtained some most remarkable results which have attracted the attention of the scientific world as no other discoveries in physics have ever done before. When it is understood that the oscillations, in order to produce the sensation of light, must be with the rapidity approximating to 50,000,000,000,000 per second, and it is known that Mr. Tesla has only succeeded in getting a few hundred millions, it will be seen how far he is from the requirement of theoretical perfection in his line.

Mr. Tesla uses tubes in which partial vacua have been produced and, by holding there within a rapidly alternating electrostatic field, with no metallic connection whatever with the source of electricity, has succeeded in rendering the whole interior luminous with a glow resembling that produced by the firefly. The peculiarity of these rapidly alternating currents referred to is that they no longer will follow what have been heretofore known as "good conductors of electricity," but will penetrate with ease walls of the best insulating material of which we have any knowledge, while they are stopped entirely by the thinnest sheet of silver or copper, just as the light rays are intercepted by opaque substances.

There is no doubt that the incandescent light is decidedly the best to work by, if properly handled. It is necessary to have the light hidden so that the direct rays will not strike the eye. At the School of Mines, Columbia College, New York, they some time since investigated this subject very thoroughly in the effort to discover which was the best illuminant for their library. The investigation was made in the early days of electric lighting. They employed the best talent they could reach in this country, and came to the conclusion that there was nothing equal to the electric light for readers. The arc light is more trying to the eyes for the reason that it is very intense and is always more or less unsteady.

There is one point in regard to the electric light about which there is a good deal of public misapprehension. It is commonly believed that colors can be detected by the incandescent light. This is not so. The incandescent light is a yellow light just as gas is, and colors cannot be detected by it any better than they can by ordinary gas or lamp light. The arc light, however, is a white light, rather inclined to purple, and colors can be han-

dled very successfully by that light. In many lithographing establishments where work is done at night, the arc light is used very successfully, and, in fact, has increased the hours during which such work can be done from twelve to twenty-four.

The outlook in the electrical field is for a cheaper method of generating electricity than through the agency of the boiler and the steam engine. Many attempts have been made to get the energy direct from the coal without the intervention of the boiler and the steam engine; but none of them have so far proved successful. But it seems quite likely that investigation will not stop at the coal as the direct source of electricity, but will go even back of the coal and obtain the energy from the same source from which the coal itself obtained it—by the utilization of some of the less apparent natural forces of Nature, such as the atomic and molecular vibrations. How this will be accomplished of course no one knows, as yet; but there are a great many broad minds at work on the subject, and there seems to be a general feeling among scientific men that we are approaching a very important crisis in scientific development. The direction which this development will take is not yet definitely known further than, as far as electricity is concerned, it certainly must be in the direction of a cheaper method for the generation of the current, the steam engine and boiler being a most inefficient transformer of energy, scarcely ever rising very high, as in the best of our compound steam engines there is an efficiency of but from 13 to 15 per cent.

NEW YORK CITY.

ELECTRIC RAILWAYS.

BY WILLIAM W. SHARE, PH.D.

Electric traction is not as new as some people suppose; but the introduction of dynamos in connection with electric traction is not so old. As long ago as from 1835–'37 Thomas Davenport, an American blacksmith, made a model of an electric motor which ran on a circular track. This model was run by a battery. In 1840 Moses Farmer also made a small electric car run by batteries. In 1851–'52 Prof. George G. Page, using primary batteries, made an electric locomotive which ran on the Batlimore and Ohio Railroad; and Congress voted $50,000 for this experiment. This locomotive ran between Washington and Bladensburg, but was not a success.

From that time up to 1874 there were numerous experiments in this direction, but no practical applications. In 1874 C. J. Vandepoele made some experiments in Detroit upon an electric car run from a dynamo; but there was never any public exhibition of that. To Stephen D. Field probably belongs the credit of having first put into operation a fairly successful system of electric traction. This was in 1877 when they were arranging the car lines on the hights in San Francisco. Mr. Field suggested to overcome some of the heavy grades there, the use of the motor car run by dynamos from a central station. He sent to the other side for a dynamo—there were none constructed here at the time—and the one that was constructed for him abroad was lost by shipwreck on the way over. He sent for another one, received that in due time, and introduced it.

In 1883 Leo Daft operated a full-sized passenger car over the Mt. McGregor Railroad, and, at the same time, Mr. Field's electric locomotive was exhibited at Chicago, transporting about 27,000 passengers. In the following year, 1884, Elison had his little experimental road in operation at Menlo Park, and on July 27th, 1884, an electric car was running trips on schedule time over a mile track in Cleveland, O. That was the first electric car in regular operation on a street railway in the United States. This was on the underground plan of slot and conduit in the grouad, and was run on the Bentley-Knight system; *i. e.*, an underground conductor with the current taken away from the conductor by a trolley wheel below the car. That plan, however, was given up in 1885, and it may be said that all this was experimental in the beginning. It was not until about 1888 that electric traction became a commercial success; since then, of course, the development has been rapid.

At the beginning of 1888 there were 13 roads in operation, about 48 miles of track, and 95 cars were in use on these roads. That represented practically all that had been done up to that time. At the present time, in the United States and Canada, there are about 500 street railroads operated by electricity, a gain of nearly 200 in two years, and equal to one-half the total street railway systems of America. Over $200,000,000 are invested in these roads. According to a recent dispatch from abroad the electric railway has penetrated even the fastnesses of the Tyrolese mountains, a road twenty-seven miles long being projected between Riva and Pinzola. Nearly all of these roads are operated by the single trolley system.

Electric traction has been developed in two ways; in one, the locomotive carries its own source of electricity, and that is the storage battery system. In the other the electricity is taken from a wire, either strung above the tracks, or placed in a conduit along the tracks, or taken directly from the tracks themselves.

With regard to the storage battery system, on account of the great weight of the storage batteries themselves, necessitating practically a full-loaded car, before any passengers are aboard, and also on account of the amount of handling that is necessary in taking out discharged batteries and replacing them by newly charged batteries at the end of every trip or two, that system has received very little practical development, and may be said to be in the experimental stage yet. While numbers of cars have been equipped for experimental purposes, I do not know of any road that is operated regularly by the storage battery system.

In the central station systems, where the current is produced at a central station dynamo, and then fed to the cars through line wires—leaving out of consideration, for the moment, the slot system and the system where the current is fed along the rail itself, and considering only the overhead system—there have been two ways of working that plan. One is with a wire running from the dynamo on poles and stretched over the road with a return wire coming back alongside of the first one; and the other way has been with an outgoing wire stretched over the road to a return wire sunk into the ground, but not insulated. The first with both wires is the double trolley system, and the second, with a return wire in the ground, is the single trolley. The trolley is the wheel that runs along the wire and takes the electricity from the wire, leading it by appropriate connections to the car. As it is in use at present, it is a wheel placed at the end of a long, flexible arm that, by a proper arrangement of springs, is pressed against the overhead wire. In the two-wire arrangement a double trolley wheel is used, the current coming down through one trolley, passed through the motor of the car and returned to the dynamo by way of the other trolley and the return wire. In the single trolley system the current goes through the trolley, down through the motor of the car, and then through the wheels of the car into the tracks, each section of track being connected with a bare wire sunk in the ground between the tracks and the current, returning to the dynamo practically through the earth; the purpose of the bare wire between the tracks being for the sake of getting a sure ground connection and not depending upon the tracks themselves.

It might be said, as far as the conduit systems are concerned, there are difficulties in the way of insulation that have prevented those systems from becoming successful. The condition of things in roads that are in practical use to-day, is that there are, to my recollection, only two double trolley roads in existence, one in Cincinnati, and the other in Camden, N. J. All of the others that are in operation, are single trolley roads. I know of no conduit roads, and no storage battery roads, that are in practical operation.

In regard to expense of construction it may be said that the underground is more expensive to install, and in operation it also would be more expensive on account of greater liability to loss of current.

The statements that have been made from time to time that the overhead system is dangerous to life, are more or less exaggerated. At first, when the overhead systems were introduced, a current pressure of probably 1,000 volts was in use; now the companies have almost universally adopted a current pressure of about 500 volts. Five hundred volts would kill a horse, but there are doubts as to its killing a man. Elihu Thomson, one of the inventors of the Thomson-Houston system, claims that he has taken 10,000 volts without injury, and frequently as much as 1,000 volts, once, I believe, claiming to have taken 1,000 volts alternate current, which is said to be so dangerous. To correct a popular error it may be said that the electricity is not communicated to the people in the car. The car body is made of material that is insulating, and the electric current has no influence whatever upon the passengers in the car. The magnets of the dynamos probably have some influence on pieces of steel that are carried in the pockets of passengers, a fact of which we have cognizance from the magnetization of watches. There is nothing peculiar in the construction of electric cars excepting that the motors are always underneath, either a central motor between the two car trucks or a motor under each truck.

While it is true that there is very little danger in this kind of locomotion—of course there is some danger, but not to the extent to which people are led to believe by reports that are seen occasionally in the newspapers. For instance, at the time when it was suggested in Brooklyn to string the wires to the elevated railroads, one of the newspapers suggested what a fearful loss of life would occur in case the current strayed from the wire. While not making the statement in so many words, it practically prophesied that the current would climb up into the cars of the elevated railroad and proceed to kill everybody in the car, and that people going along innocently and unsuspectingly about their business might be slaughtered by this fearful agency. The current, so to speak, would be wandering around on the rails of the elevated track, waiting for a train to come along. And all this was said seriously. The truth of the matter is, if there were any leak the iron structure of the elevated railroad would prove a most excellent means for the current to seek its way to the ground. The only reason why a live wire hurts anybody is because the person gets in between it and the ground, which the current is trying to seek.

Various attempts have been made to overcome this element of danger, if it be there, and systems have been devised which have been claimed to be free from danger. Most of the experiments with the storage systems and the conduit systems have been for the purpose of devising some plan by which this danger from overhead wires would be eliminated. There are at present in the Patent Office applications for an entirely new method of operating cars by electricity. This might be called the induction method.

There is no direct contact between the car and the wires carrying the current from the dynamo. The wires are strung along the tracks and in the ground, and the tracks act as the primary coil of a transformer. The car has a coil underneath it which travels close to the track rails. A current of electricity is produced in this coil in the car by the influence or induction of the current in the track, and that current which is introduced in the car operates the motor. This is a system of electro-magnetic induction, and patents have been applied for by G. Emil Hesse, of New York.

If this plan proves successful, it will entirely remove every element of danger in this kind of railroad. As the current is only traveling in the sections of track when the car is immediately over the section, when the car leaves the section, the current ceases to flow in that particular section, and flows in the next succeeding one, so that, except immediately underneath the car, there is no electricity in the road. And then if there is any break in the main wire, being in the ground already, it can do no damage.

A similar system to this has been devised by Mr. Ries, of Baltimore. Neither of these induction systems is yet in operation; but they promise a relief from such dangers as there may be in the trolley, as it is applied in crowded cities.

The speed of the car is regulated by a resistance-box that is under the control of the driver; by throwing in or taking out resistance he can slow the car or increase its speed. The car is stopped, of course, by cutting the current out entirely; that is controlled by a switch which he has at his hand.

The trolley is cheaper than the horse railroads in operation and very much cheaper than cable roads. In point of cost of introduction the trolley and the cable road cannot for a moment be compared, the cable being so much more expensive. That is one reason why the trolley road has been so largely introduced in all our cities. Where there has been strong opposition to the trolley, on account of the danger and the disfigurement of the streets, the cable road has been introduced; but the probability is that, with free choice, the companies would invariably install a trolley road in preference to the cable.

The speed of an electric road is only limited by ordinances which control it in particular cities. The speed that can be maintained on an electric road is dependent upon so many conditions that a prophecy as to what it will be in the future, does not amount to much; it may be possible to reach 150 miles an hour, but nobody can say that it will be possible. Of course, in the case of small experimental cars that speed has been reached, but it is problematical when it will be reached with large cars. An inventor in Florence, Ala., claims to have made an electrical motor which has developed a speed of 120 miles an hour. Dr. Louis Duncan, Chief of the Electrical Department of the Johns Hopkins University, says there is no doubt such great speed can be made if a very large motor be constructed for the purpose. In commenting on this intelligence Dr. Duncan says:

"The tendency in electricity is to make everything large. The cars which were at first used in Richmond, Va., where the first successful electric railroad was built, had two seven and a half horse power motors. Now cars for the same work have 25 horse power motors. The speed and size of cars have increased, and the tracks and trucks have had to be strengthened in proportion. The wear on the track with electric cars is very great on account of the fact that a considerable part of the weight of the motor is directly on the axle and is not supported by springs as in the case of a steam locomotive. The question of track construction has, therefore, become a very important one, and the weight of rails in the ordinary street-car track is as great as on a steam railroad. There has also been a marked increase in the size of dynamos to supply currents to street railways. At the West End station in Boston large slow-speed engines are used. These are belted to a counter-shaft, and to this shaft are belted a number of small dynamos. This plant was designed several years ago. The multiplicity of belts and the number of machines make a very complicated station. In Brooklyn, N. Y., where a plant of the latest design is being erected, dynamos will be of 2,000 horse power each, connected directly with engines of the same size. The tendency is to larger units and slower speed. In the Sprague Railway, in Richmond, Va., which, as already stated, was the first successful electrical railway, the motors revolved at a high rate of speed, and there were two sets of gear wheels between the armature and car axle. This practice held for a couple of years. Now the motors revolve at a lower speed, and there is but one set of gears between the armature and the axles, while several of the electric companies are turning out motors which are placed directly on the axle and which have no gearing."

But the lines along which inventors are now working is to remove the danger from the trolley, and to overcome the necessity of stringing the wires overhead. In the Hesse system, already referred to, there is no disfigurement of the street. Looking on a street in which this road is installed you see a track flush with the pave-

ment; there are no poles, not even the railroad track, such as we use at present. The cars to be used will, of course, in appearance be like ordinary street cars without horses. In making repairs one section can be removed and replaced by another. In the trolley system there are practically no repairs necessary any more than in ordinary street railroads, because the ground connection having once been made that will remain good for years, and the only necessity is to replace worn rails occasionally, as would have to be done with any railroad. In the cable systems, or in any conduit system that is used, it would be necessary to clean them out repeatedly.

An interesting illustration of the application of electricity in traction is a series of experiments that are at present being made on the Erie Canal. If a wire is strung along over the canal the current, by means of the traveling trolley, can be brought to a motor in the canal boat, and the use of mules and horses on the canals will soon be dispensed with entirely.

Of course, for underground work in mining the trolley has a very wide application. In such work a wire is readily strung through the different galleries of the mine, and by means of a single or double trolley the car can be connected directly with that wire and easily operated.

It can be said with regard to electric roads that the trolley can always be applied in small towns and thinly settled districts where first cost is an element in the commercial success of the road. In large cities, where the disfigurement of the streets through overhead wires, and the popular fear of danger from those wires become important elements, cable roads or any electric road, even tho it may be very much more costly than the trolley, will always be preferred.

BROOKLYN N, Y.

ELECTRICITY APPLIED TO HOUSEHOLD AFFAIRS.

BY GEN. E. S. GREELEY.

The first electrical invention to be utilized in the household was the electric bell. The annunciators have of late years been very much improved and elaborated. It is now possible for a guest in his room at a hotel not only to give a signal to the clerk at the desk, but also to indicate, within certain limits, what he wants brought to his apartment, such as towels, newspapers, a pitcher of ice-water, etc. The internal machinery somewhat resembles a piece of clockwork, and the annunciator is something like the small ones in offices used for the purpose of calling a messenger, the police, and a fire-alarm. You turn the hand around to the chosen indication. In doing so you mechanically turn certain wheels and ratchets into position, and, when you press the knob, a signal is given corresponding to the combination presented by the ratchet or wheel.

To secure the perfect operation of the electric bell a great many devices have been resorted to; for instance, that of doubling up or tripling the number of points of electrical contact upon which the operation of the vibrating bell depends. It is obvious that if a bell has two or more contacts it will be sure to ring, even in the event of one contact being defective through the presence of dust, oxidization, or any other trouble. In the case of a bell with a single contact a defect would altogether prevent its operation. This has led to the improvement of what is called, in trade parlance, the double-contact and treble-contact electric bell.

Of late years manufacturers have been making mechanical improvements for the purpose of preventing the entrance of dust and insects into bells, producing what is known as dust-proof and insect-proof bells. It is well known that if insects—spiders, flies, etc.—get inside of a bell, in the course of a short time they will effectually prevent its operation by clogging up the works. This is a very serious trouble in the tropics, and is aggravated by a certain kind of bee peculiar to the country, that has a habit of depositing its wax in almost any crevice where it can find lodgment. The result is it is almost impossible to secure an absolutely perfect bell for that section of the world. For even if the machinery is perfect with the exception of an exposed pivot the bees will deposit on that pivot and seal up the bell itself.

Appliances for ringing from the dining table to the kitchen are interesting, and are quite diversified in their character. Some of them are made to fasten directly to the table, and to be pressed by hand; others are fixed permanently on the floor, and are to be pressed by the foot. Others, again, are loose, and can be moved about on the floor from one place to another so as to be placed in the most convenient position, in the event of the table being enlarged to suit the requirements of a large company. Still others are a combination of the fixed appliance—they can be both pushed with the foot and pressed with the hand. Sometime they are placed at both ends of the table, so that both the host and the hostess can govern the signals.

When placed upon the table it is found desirable at times to conceal the push button. On this account various ingenious devices have been resorted to, such as making it a part of the napkin ring, or other ordinary equipment of the table so that its presence will not be noticed.

The invalid's electric bell is an equipment, or an outfit, containing a battery bell, push-button and contact cord, put up in a compact and attractive shape, so that, in an emergency, it can be readily unrolled and the push-button placed in possession of the invalid at the bedside, thus allowing him to call the electric bell in the adjoining room or corridor.

To notify householders of the delivery of letters at the front door by the postman there are automatic contrivances. When letters are delivered in that way the box itself automatically rings a bell in the desired apartment. This improvement is apart from the usual devices of a push-button which is used by visitors to indicate their presence at the door.

The push-button itself has branched out into astonishing ramifications. These buttons are not only now made out of a dozen or two distinct materials, but in thousands of patterns and in a multitude of finishes. Formerly they were only made of wood, but now they are made of porcelain, brass, iron, *papier-maché*, hard rubber and various composition, such as celluloid, etc. Through the use of these different materials very elaborate effect are obtained so as to match interior decorations, such as the various styles of wall paper, lincrusta, etc.

The excuse having been given by servants from time to time to cover their negligence that "the bell didn't ring," has led to the invention of the indicating push-button. This device consists of a small magnet in the interior of the button itself, so that when the button-knob is pressed, if the bell rings it actuates the small magnet in the button and gives evidence of the fact. Since the magnet in the button is itself operated only by the action of the bell, the evidence is very conclusive that the bell is rung when the magnet operates, which it usually does by a slight buzzing sound.

Burglar alarms and annunciators have been used to a considerable extent for the last twenty-five years, but their patterns have been improving steadily during that time. They have been made more perfect, elaborate and complicated in their functions, and ornamental. They are not only used now to signal the want of a servant, but they are also used, for instance, to tell the servant to light the gas or to turn on the electric light. This latter feature is very valuable in connection with burglar alarms, for, when the house is all dark, and the occupants are asleep, at the same time that the alarm starts to ring, it turns on the light—giving at once a general illumination for the people in the house and exposing the burglar to detection.

There are also appliances based upon clockwork, for the purpose of automatically turning the burglar alarm into action at a given hour at night, say ten o'clock, and also to automatically cut the burglar alarm out of circuit at a given hour in the morning, say at five o'clock, when the servant gets up; also for cutting off a certain part of the house, so that the servants, when they arise and go about their work, do not disturb the rest of the occupants who rise later. At the same time if anybody should, through carelessness of servants, obtain an entry to the lower part of the house and seek access to the upper part or sleeping apartments, the alarm would still be on in that part and protect it.

A very good contrivance is what is known as the electric mat. This is a series of electrical contacts mounted upon a semi-flexible mat which may be placed under the carpet or a rug, as desired, and of such a size as may be wanted. For burglar-alarm purposes it is frequently placed immediately beneath the windows, so that in the event of an entry being effected by a burglar, upon stepping inside of the window or door he unconsciously gives the alarm. It is also considered desirable to place a piece of this matting in front of a safe or buffet where the silver and wine are kept, and also upon a few of the steps of the stairway leading to the upper part of the house. In this way, if proper precautions are taken, no burglar can enter without stepping upon some of these devices, and so alarming the whole household.

Other electrical appliances for household use are automatic thermometers which in winter regulate the supply of heat in bedrooms, and in summer control the supply of fresh air. Clocks are placed under electrical control, and compelled, mechanically, to keep "the exact time." Garden fountains are illuminated by the electric light.

Electricity has also been largely used in the household for power purposes. In the homes of the wealthy, electric elevators are found to be a great convenience. The motor which supplies the power for such apparatus can, in the lower part of the house, run the washing machine, the clothes wringer, the ice-cream freezer, and, in the case of a country mansion, can run a churn. In the upper part of the building it can furnish power for a carpenter shop for the boy and rock the baby's cradle.

In the case of sickness electricity is utilized as a bed-warmer, or an invalid's pack, and is especially serviceable on account of the heat being retained and from the fact that the temperature can be gradually increased after it is applied, if it is desirable to do so. Curling tongs in the boudoir can be easily heated internally by electricity. An electrical thermostat can be placed over a furnace to signal an alarm in case the furnace becomes overheated. There are also contrivances which will automatically open and close dampers electrically, thus maintaining an even temperature in the house and saving considerable money in coal. Patents have also been granted recently for electric refrigerating machines. These require a stronger current than can be derived from batteries. It is also a singular fact, in connection with this wonderful power, that the leaves of a book will not turn yellow if exposed to the rays of the electric light; also, that the voices of singers and voices generally are much better preserved in rooms or halls furnished with the electric light than in those where gas is used. One ingenious device has been perfected by means of which leaks in water pipes can be detected and located. Magnetized keys are made by which safes can be opened, and, attached to some clocks, there is a small phonograph which speaks the time of day in a pleasant tone every quarter of an hour, instead of striking it on bells. If a man lives in the country where the streets are not lighted, and he is obliged to return home late, he will find the magnetic cane a useful companion. This cane contains a battery that supplies the current for a small incandescent lamp inserted in the head. Whenever it is desired to use the lamp, a cap covering the lamp is removed and the cane inclined in such a manner that the contained solution comes in contact with the plates of the battery. A current is thus obtained which, it is stated, will maintain the light for a couple of hours without replenishing.

The electric motor for household use is valued because it is compact, weighing less than 100 pounds per horse power, easily controlled, being stopped or started by the turn of a switch, works silently, and is clean. In country houses, it is especially useful for elevating water from wells or cisterns to the higher stories. It can be applied to lawn mowers, carpet sweepers and shoe polishers. It has even taken the place of servants at the dining table. Sometimes a small railroad track runs around the table within easy reach of each guest, passing over ornamental trestlework, through a shutter in the wall. The hostess signals for each dish as it is desired which is placed on a small motor and sent from the pantry to the table. As each guest helps himself he presses a button, at his side, and sends the car on to his next neighbor. When the cars are empty they return silently to the pantry. Parlor organs and automatic pianos are supplied with air by means of this power; and it has been discovered that large arc lamps, placed in conservatories will materially help the growth of certain plants which it has been found do not need sleep or long periods of rest.

These household appliances are used all over the world. They are being used to a considerable extent throughout the Antilles, Central America, South America, and even in Africa.

The appliances which come under the general name of magneto-signal bells have, in the past, been almost entirely confined to the telephone trade. But with the probable abandonment of some of the chief patents that control the telephone they will soon become articles of regular household use. They are bells requiring no battery, and have heretofore been used in connection with the telephone. With the expiration of these patents they will be used in private houses just as commonly as electric bells, and they are especially desirable because you do not have to depend upon a battery. Batteries require more or less attention either once a year, or five or six times a year, whereas this magnet is the same as any piece of mechanism, like a sewing machine or a watch. It is only necessary to turn a crank, and, by a mechanical movement, reach the current. This will soon be used largely in general household electrical appliances.

The expiration of the patents referred to will have the effect of broadening the application of the telephone, and incidentally lead to the substitution of telephone wires for speaking tubes in private houses. It is not likely, however, that the telephone will take the place of speaking tubes in noisy localities, such as railroad stations, factories and places of that character, but in offices and, perhaps, in hotels, apartment houses and private houses, on account of its being so much easier to run electric wires and keep them in repair; and, not being open to the objection of permitting odors to come up from the kitchen, they will be preferred. It will also be easier to introduce them. The probabilities are that when the expense of introducing the apparatus is considered, the additional cost, compared with the advantages to be derived from its introduction, will be so small as not to operate against its general use.

It is possible that, in the future, houses may be heated by electricity. In that case the current would probably have to be supplied from central stations. Altho coal would have to be used to heat the boilers, it is probable that the cost to individual consumers would be less than at present, because a cheaper grade of fuel could be used. In regard to this question we can only prophecy from what has already been accomplished. At the present time we have sadirons, chafing dishes and a number of kitchen utensils heated electrically. It is quite possible now to sit at the table and make your own omelet, boil your coffee, and fry your cakes with the aid of electrical appliances that are, at this day actually and commercially upon the market.

In such cases, the electricity is obtained in the same way that it would be obtained for the operation of an electric fan; that is to say, by the removal from its socket of the ordinary electrical lamp and putting therein a plug with flexible cord attached that leads to the utensils. This method is much more convenient than at-

taching a rubber hose to the gas. The cord is more flexible, it is not as large, and there is no smell whatever. One important feature of it is that you can always keep your food at a given temperature, turning the heat on and off without even striking a match, the changes being made by simply turning a key.

A Washington man has lately applied for a patent on an electric sleigh. Stored electricity concealed beneath the seat of the sleigh furnishes the power which is to propel the vehicle. This power is transmitted to a single wheel in front of the sleigh by means of an endless chain. The face of the wheel is furnished with cutters which embed themselves in the snow and prevent the wheel from slipping. It is said that a speed of twelve or fifteen miles an hour can be attained by this motor. A lever to control the steering gear, and another lever to regulate the speed of the sleigh are placed near the occupant's seat in the vehicle.

NEW YORK CITY.

ELECTRICITY IN MINING.

BY WILLIAM L. SAUNDERS.

The application of electricity for mining purposes has been a captivating field for research during the past three years. The several electric companies, with a host of young and inexperienced theorists at their command, have plunged into the field of electric mining machinery with a zeal and self-assurance which has astonished the experienced mining engineer.

The application of electricity to mining may be divided into two classes: (1) That of long-distance transmission of power to mines; (2) that of power supplied to the machinery in the mine. That many failures have been recorded both in long-distance transmission of power and in the application of power to mining machinery no one can dispute. Some of these failures have been stupendous in their magnitude, involving the expenditure of hundreds of thousands of dollars. The most notable failures are in the line of the application of power in the mine, and it is in this line that electricity has many limitations.

Long-distance transmission of power will be first considered, because it is the most important application of electricity for mining purposes, and its success is no longer an open question. The problem of transmitting power is one which has baffled the best engineering skill. In mining operations electricity at once pointed the way to the best results, because of the availability of water power and the inaccessibility of some mining regions. Gold, silver or other mines, where hard rock has to be contended with, involve the use of power in large quantities, not only for mining the ore underground, but for its treatment on the surface. Where fuel is expensive, as it frequently is at the shaft, the question of supplying power from a neighboring waterfall immediately led to the introduction of electric machinery. Wire rope, compressed air or other means which have so long been used for the purpose of transmitting power cannot compete with electricity in availability or economy where the transmission covers a long distance, and where it runs over uninhabited, irregular and inaccessible districts. The early installations involved the use of a direct or continuous current, but it was soon realized that a limit was reached in transmitting the continuous current, beyond which there could be no economy in electric transmission unless the transmission was made at high potential. The difficulty of commutating currents of high potential has prevented the installation of plants where it has been found that low potential and heavy currents are impractical from a financial point of view. The alternating current has solved the problem, not only because of the ease with which it can be transformed from large quantity and low potential to small quantity and high potential and inversely, but because of the absence of commutators on either motor or generator. The greatest success in long-distance electric transmission has been by means of an alternating current of high voltage. Two or more currents are used differing in phase. This requires two or more wires. *The Electrician* describes a plant of this kind situated at Lauffen, Germany, on the river Neckar, which furnishes currents of low potential to a bank of converters, which in turn transform it to currents of small quantity at a pressure of about 25,000 volts. This transmission plant is the longest in the world, the power being transmitted a distance of 112 miles. At the Frankfort Exhibition the current passes through a similar bank of converters, transforming it again into large quantity and low potential for the motor, which is a similar machine to the generator at Lauffen. The efficiency of this plant is given at 68 per cent., which is remarkably high considering the distance.

In America the number of long-distance transmission plants is small, and it is difficult to get at reliable information as to the efficiency. The Brush Electric Company have installed at the Dalamatia mine in California a compound-wound generator, giving 40 amperes and 1,800 volts, which is driven by a Pelton water wheel under a head of about 100 feet. The current is carried to the motor at the mine, a mile and a half distant, the power being used for driving stamps and other mining machinery.

In 1889 the Brush Company installed a plant at Virginia City, Nev. The water power available at the level of the stamp mill was entirely inadequate to drive all the machinery, consisting of some 60 stamps. After using the water on the upper level it is carried down a distance of 1,680 feet and utilized for driving electric generators, the current being carried back to motors located in the mill. The commercial efficiency of this plant is said to be 70 per cent. and the horse power delivered about 500.

Another plant is now being installed at the Calumet and Hecla mines. This plant is intended to convey electric power a distance of 8,000 feet to motors applied to pumps. The horse power delivered to each motor is about 80.

Probably the most important and successful long-distance transmission plant in this country was installed by the Westinghouse Electric & Manufacturing Co., at Telluride, Col. This is an alternating system throughout, the generator is capable of delivering about 30 amperes and 3,000 volts. The wire is carried up the mountain on poles to the mines, a distance of two and three-quarter miles. This is a synchronous system. The motor and generator being similar machines, run at exactly the same speed irrespective of the amount of work done. The cost of this plant, exclusive of erection and pole line, is said to be about $10,000, or about $100 per horse power delivered, and its efficiency is stated at 75 per cent.

Besides the foregoing there are many installations of power plants for purposes other than mining. An extensive alternating plant of the Westinghouse Company is used for lighting and power purposes at Portland, Ore., the power being supplied from the Willamette River at Oregon City, a distance of thirteen miles from Portland.

With the alternating system of the Westinghouse Company the extension of transmission to greater distances is merely a question of how high the electromotive force can be carried. The cost of copper diminishes considerably as the voltage increases. If the copper cost is one hundred dollars with five hundred volts it will be only one dollar at five thousand volts. There are many difficulties, however, in the way of high tension. The cost of construction is greater and the liability to accident very much increased. The most promising results at present in long-distance transmission are those obtained by the Tesla system. This system possesses the characteristics of simple construction combined with the use of high electromotive force.

It is in the line of the application of electric power *within* the mine that electricians have made their most fatal errors. It seems astonishing how general the belief is that there is a long-felt want in mining operations for some power like electricity. Numerous papers have been read before engineering societies, and statements have been made about the advantages of electric transmission in mines over all other means. About two years ago the Engineering press was pretty thoroughly occupied with illustrations of electric rock drills, electric coal-cutters, pumps, hoists, tramcars, etc. Efficiencies were shown with the electric drill and actually read before a prominent engineering society, in which it was claimed that an electric rock drill did as much work, at an expenditure of three horse power, as a percussive steam-drill did at eight horse. In view of the fact that, as Professor Thurston says, "electricity is but the handmaid of steam," this claim was distinctly amusing. It reminded one of the sign hung up in the window of a toystore on Broadway, New York, around which crowds of people stood gazing at a little toy steam engine, over which was the sign: "Electricity is Rapidly Replacing Steam. Steam Engines Selling Cheap."

A gentleman who characterizes himself as "Not a mining, but an electrical engineer," in a discussion as to the relative merits of electricity and compressed air before the Illinois Mining Institute, recently said:

"A good many of the failures of the past in applying electricity have been failures for the simple reason that no judgment has been used as to existing conditions. I have heard operators say that they cared little about the efficiency; what they wanted was a machine which would do the most work in a given time, and which would cost but little for repairs, and which would not get out of order."

This statement accounts for many of the failures with electric machinery, especially rock drills and coal cutters.

No one will deny that electricity has many important applications within the mine. Its use as a lighting agent largely facilitates the work of the miner, not only because he gets more and better light, but because the mine is relieved from the discharge of noxious products of combustion and the danger from ignition of gases is lessened. Lighting is the most important application of electricity to mining. Next in importance, and in the line of success, is the electric mining locomotive. The small space that it occupies, and the fact that the trolley can be used, enables the mine locomotive to traverse narrow drifts, and to do more and better work than the typical mule. The use of the trolley reduces the size of the electric below that of the pneumatic locomotive, thus giving it a preference in mines. Electricity has also been applied successfully for driving pumps and hoists. It is also used to a limited extent for coal cutting. In these applications, however, it must not be forgotten that the electric engine simply replaces the steam or the air engine, the pump, the hoist and the coal cutter being simply the regular types used heretofore.

The electric rock drill, except in its rotary form for prospecting, may be safely said to be a failure. No one can affirm or deny what the future may bring forth in this line, but at the present time electricity has not proved to be a success for drilling rock. Several machines have been built, notably the Marvin-Edison and the Thomson-Van Derpoele. Mines were equipped, among them being the Ute and Ulay mines at Lake City, Col., where electric drills were installed in September, 1891, and the experiments were continued through September and October. The *Engineering and Mining Journal*, of December 26th, 1891, speaking of this plant, says:

"Many mechanical difficulties were encountered, some of which were overcome, but the great trouble was the heating of the machine. After much work upon this problem the electricians decided to give it up for the present. A like experience was had at the Last Chance mine at Wardner, Idaho."

At the present time there is not a single mine where electric rock drills are employed, and the only electric rock drill now in continuous operation is at a quarry in Syracuse, N. Y., near the works of the Edison Company. Much money might have been saved had the electric companies employed practical rock-drill men to advise with them as to the requirements of a percussive rock drill. Lightness of weight consistent with high efficiency is one of the first requisites of a successful mining drill. It has been found to be impossible to construct a percussive rock drill of the same efficiency as an air or steam drill without more than doubling its weight. Mechanical difficulties were also involved, and tho some of them were overcome, the heating of the machine proved to be a serious obstacle.

The popular impression that compressed air is in some way objectionable for the operation of mining machinery, is an error. Not only is compressed air the simplest means by which to operate mining machinery underground, but the fact that it serves the purpose of ventilation and cooling is an important point in its favor. The great value of electricity in mining seems, therefore, to be in transmitting power, and for lighting and haulage purposes. By means of electric air-compressors the power may be converted into compressed air and used in the mine for driving rock-drills, pumps, etc. Electric air compressors are simple in construction, light in weight, and may be placed within the mine.

NEW YORK CITY.

THE STORAGE OF ELECTRICAL ENERGY.

BY PROF. GEORGE F. BARKER.

On the twelfth of May, 1881, a box having a volume of about one cubic foot and weighing about seventy-five pounds, was delivered to Sir William Thomson at Glasgow, having been brought by a special messenger from Paris. On testing it, it was found to contain more than one million foot-pounds of energy, this being substantially the same quantity which had been put into it in Paris, seventy-two hours before.

The greatest interest was excited in scientific circles by this experiment. Even Sir William himself became enthusiastic over it, and in a letter to the *Times* speaks of "the marvelous 'box of electricity'" as embodying "a realization of the most ardently and unceasingly felt scientific aspiration of my life—an aspiration which I have scarcely dared to expect or to hope to live to see realized." In pointing out some of the advantages of this storage of electrical energy, he says:

"The largest useful application waiting just now for the Faure battery—and it is to be hoped that the very minimum of time will be allowed to pass till the battery is supplied for this application—is to do for the electric light what a water cistern in a house does for an inconstant water supply. A little battery of seven of the boxes described by your correspondent suffices to give the incandescence in Swan or Edison lights to the extent of 100 candles for six hours without any perceptible diminution of brilliancy."

With reference to its use for power, he states:

"I have quite ascertained that accumulators amounting in weight to three-quarters of a ton will suffice to work for six hours from one charge, doing work during the six hours at the uniform rate of one horse power and with very high economy."

"The question of economy between accumulators carried in the tramcar, as in M. Faure's proposal" [he continues], "and electricity transmitted by an insulated conductor, as in the electric railway at present being tried at Berlin by the Messrs. Siemens, is one that can only be practically settled by experience. In circumstances in which the insulated conductor can be laid, Messrs. Siemens's plan will undoubtedly be the most economical as it will save the carriage of the weight of the accumulators."

Nearly twelve years have passed since this "box of electricity" was thus tested. It is interesting, therefore, to inquire whether the advantages which the storage of electrical energy seemed at that time to promise have been realized.

The idea of storage, whether of matter or of energy, is quite familiar to us. To make the supply available at will or to render it constant, money is stored in banks, water is stored in reservoirs, and coal is stored in bins. So, for the same reasons, energy is stored in the coiled mainspring of a watch, in the compressed air of an air-

gun, or in the rapidly rotating flywheel of a steam engine. And by means of suitable mechanism, the energy thus stored may be made to perform work.

The principle upon which the storage of energy is based, is a simple one. Evidently whenever two bodies attract each other, force must be exerted in order to separate them; and work is thereby done to an amount represented by the product of the force into the distance through which it acts. To raise a pound through a foot, for example, the force of a pound weight must be exerted through a foot of distance and the work done is one foot-pound. Hence 20 pounds raised through 100 feet or 100 pounds raised through 20 feet, represents a a foot-ton of work.

If the two attracting bodies be considered as a system, the work thus done in separating them, is stored in the system and the energy of the system is thereby increased to an extent precisely equal to the work done. Since the work done upon any given system, by any other system represents the energy stored in that other system, which energy in being transferred exerts force upon the former system and so does work upon it, it is evident that the operation of exerting force and thereby doing work, is a consequence simply of the transference of energy from one system to another; the gain in one case being precisely equal to the loss in the other. When a globule of melted platinum is dropped into water, the hydrogen and the oxygen are separated from each other; the heat-energy of the platinum being transformed into the energy of chemical separation of the mixed gases. In general, therefore, energy must be expended upon a chemical compound in order to decompose it; this energy being stored in the products of this decomposition, and being recoverable again when these decomposition products reunite.

To this general law electrical energy offers no exception. The decomposition of a chemical compound by the passage of an electrical current through it, results in the loss of electrical energy and in the simultaneous gain of chemical energy, which is stored in the constituents separated.

As early as 1803 Ritter pointed out the fact that if a pile of copper disks, alternating with disks of moistened cardboard, be constructed, and be connected with a Voltaic pile for a short time, it would give a current in the inverse direction to that employed to charge it. And Volta explained this result by showing that the charging current had decomposed the solution with which the disks were moistened, its electro-positive and electro-negative components being deposited on opposite faces of the copper disks; so that on removing the charging pile and connecting the terminal plates by a wire, these components reunited and caused an inverse current.

In 1859 Planté undertook an extended investigation to ascertain in what substances, commercially available, this storage of electrical energy reached its maximum; consistent, of course, with the subsequent recovery of this energy in an electrical form. He was led to adopt lead and its oxides as most suitable for the purpose. If two lead plates be immersed in dilute sulphuric acid and a current be sent through the liquid, the oxygen set free on the positive plate will oxidize its surface to peroxide. On reversing the current, this plate, now being negative, will have hydrogen evolved upon it; which hydrogen will reduce the peroxide to metallic lead. At the same time, the oxygen set free on the other and positive plate will oxidize its surface to peroxide. By repeating this operation, reversing the direction of the current each time, a layer of considerable thickness will be formed on these plates, finely divided metallic lead covering the negative plate or kathode and lead peroxide the negative plate or anode; the storage capacity increasing proportionately. By rolling the plates into a spiral, separating the two by strips of rubber, Planté produced the first storage cell which had sufficient capacity to be of any commercial use.

In consequence of the long time required to "form" a Planté cell of any considerable storage capacity, Brush in this country and Faure in France proposed, about the same period (1880), to shorten this time by applying a layer of lead oxide directly to the lead plates. Charging would then take place continuously in one direction, the oxide being carried up to peroxide on the positive plate and reduced to metallic lead on the negative one. This type of storage cell is by far the most common. The box carried to Sir Wm. Thomson was of this sort, and contained four cells, each about five inches in diameter and ten inches high. Various modifications in the details of the form and construction of the Faure cells have been proposed, consisting for the most part in the shape of the perforated plate, or grid, into which the oxide is forced.

A storage cell, having plates of zinc and lead peroxide respectively, has been exploited by Reynier, in France, and by Main in this country. The peroxide plate of the Main cell is highly laminated, and is "formed" by Planté's method. The zinc is deposited upon a copper plate kept well amalgamated; both plates being immersed in an acid solution of zinc sulphate. On charging, zinc is deposited on the kathode and the oxygen, which is set free on the anode, peroxidizes the lead constituting this plate.

Still a fourth type of cell has been proposed for commercial use, based on the primary cell of Lalande and Chaperon, and consisting of a plate of compressed, finely divided copper and a plate of sheet tin immersed in a solution of zinc oxide in potassium or sodium hydrate. On charging, metallic zinc is deposited on the tin plate and the copper is oxidized to copper oxide. During the discharge the zinc goes into solution and the copper oxide is reduced to metallic copper again. Since no lead is used in its construction, a larger current capacity can be obtained from it for the same weight of cell.

Electrical quantity is measured in coulombs the current-capacity of a storage cell being the number of coulombs it will deliver. Electromotive force is measured in volts, and in a storage-cell represents the pressure between its terminals. The quantity stored in a cell depends on the amount of material actually effective upon its plates. The electromotive force depends on the specific character of the material constituting the plates. Thus in cells of the Planté and Faure types the electromotive force is about 2 volts, in those of the Reynier type about 2.36 volts, and in those of the Lalande type about 0.8 volt. The current-capacity of cells of the Faure type may be stated approximately as 15,000 coulombs per pound of plate; of cells of the Reynier type as about 28,000; and of cells of the Lalande type as nearly 40,000. Since, when one coulomb flows per second, the current strength is one ampere, the above values correspond to about four, eight and eleven ampere-hours per pound of plate.

Electrical energy in a cell is usually expressed in volt-coulombs; in a current in volt amperes, or watts. Thus the energy of the three types of cell above given is 8.20 and 8.8 watt-hours respectively per pound of plate. From this it will be observed that, notwithstanding the low electromotive force of the zinc copper cell, its greater current-capacity more than makes up the difference; so that its energy-capacity is greater than that of the Faure cell.

Since 7.46 watts is a horse power it is easy to estimate the rate of output of these cells in horse powers. A Faure cell weighing 30 pounds will give 240 watt-hours, and ten such cells 2,400 watt-hours—*i. e.*, about 3.25 horse powers for an hour.

The efficiency of a storage cell is the ratio, expressed in percentages, of the quantity taken out of the cell to the quantity put into it. Since this may be the quantity of current or the quantity of energy there are evidently two efficiencies, the current-efficiency and the energy-efficiency. For cells of the Faure type, which have been more thoroughly investigated, the current-efficiency is about 90 and the energy-efficiency about 80 per cent. on the average. Ayrton, experimenting under the best possible conditions, has succeeded in carrying these efficiencies up to 97 and 87 per cent. respectively.

In theory, the storage cell is a very perfect current generator. In most of its forms, the electromotive force is high and the internal resistance low; and hence it is adapted to give a strong current. Moreover, there is no consumption of material in it when in action, and hence there is no waste. Energy is put into it on charging, and there it should stay, available for instant use when wanted and recoverable on demand without serious loss.

Such a cell must have numerous and important uses. While not able to compete in economy, perhaps, with systems of direct distribution, it has a field especially its own. The storage system furnishes transportable energy in a readily available form. It utilizes this energy in the tramcar and the electric launch, and also in the many directions where a small power is needed, as for sewing machines, phonographs and the like. With a suitable storage battery, the energy of a lighting plant can be stored up in the daytime and used to supplement the output at night. Moreover, by its means natural sources can be brought into service. The windmill and the water wheel can furnish the energy to be stored. Again, the storage cell may act as a transformer, by charging many cells arranged in parallel by means of a current of low pressure and then arranging them in series, the evolved energy may be changed from a current of low pressure and large quantity to one of high pressure and low quantity.

In practice, however, the storage cell, in all its forms apparently, has serious defects. With lead cells of the active matter type, experiment shows that they must be operated continuously and must never be allowed to rest, either when charged or discharged; otherwise a serious lowering of their efficiency takes place. Moreover, it is not possible to realize in practice the theoretical capacity of the cell. Not only must the electromotive force on charging not be allowed to exceed 2.4 volts, but this electromotive force on discharge must not be permitted to fall below 1.85 volts; since in the latter case the lead oxide is converted into sulphate, and the efficiency falls enormously. Again, the rate of charge and discharge has an important influence upon the integrity of the cell, as well as upon its efficiency; a too high discharge current causing the plates to buckle and thus come in contact. Moreover, the lead cell has a high first cost, a very considerable weight for a given capacity, a material deterioration with time, a notable waste of energy and an undesirably low rate of discharge. In storage cells of the zinc-lead type, the chief defeat is due to "local action," the zinc being dissolved on open circuit and the stored energy is dissipated. The zinc-copper-oxide cell has not proved altogether satisfactory, owing to difficulties encountered in securing a uniform deposition of the zinc. Clearly the storage cell is a delicate mechanism, capable of giving excellent results in the hands of an expert, but unsuited, apparently, to the rough usages of commercial requirements.

The fact cannot be denied that the use of storage cells in this country is extremely limited. No installation of any size is known to us as used in central station lighting, altho an experiment of this sort is about to be undertaken in New York City. Nor is there in the United States, it is believed, a street railway in operation in which storage cells constitute the chief motive power, which is operated by the railway company itself. The use of storage cells is confined to small installations and experimental plants. In England, owing probably to the greater care taken in their construction and maintenance, storage batteries are much more extensively used.

If, therefore, the original promise of the storage cell has not been realized, it must be ascribed to the defects inherent in the cell itself in all of its present forms. Since the underlying principle is sound we may hope that some form of storage cell will erelong be found which will bring practice closer to theory, and make the storage of electrical energy such a commercial success as was promised in Sir Wm. Thomson's experiments of 1881.

UNIVERSITY OF PENNSYLVANIA.

ELECTRICITY AS APPLIED TO WARFARE ON LAND AND SEA.

BY MOSES G. FARMER.

Since the days of the famous "battle of the kegs," in the Revolutionary War, the torpedo has made great strides and especially since the advent of nitro-glycerin and its mixtures, such as dynamite, rend-rock, etc.

Within the past decade my attention has been necessarily diverted to other branches of this great science; but it may be of interest to some to review a little of the work done a score of years ago and subsequently.

When I entered upon my duties at the United States Torpedo Station, Newport, R. I., in 1872, experiments were just being made upon the Lay torpedo boat. It was propelled by carbonic acid gas acting through a motor which resembled a steam engine. This propelled a screw in the stern of the boat, by the action of which motion was given to the torpedo. It was started, stopped and steered by currents conveyed to the boats through two insulated cables. A current of positive electricity through one of the cables served to start the boat; a negative current through the same cable served to stop the boat at will. A current of positive electricity through the other cable served to steer the boat to port, and a current of negative electricity served to steer the boat to starboard. Thus the current of positive and of negative electricity with two cables was able to perform these four functions—start, stop, and steer to port or starboard at will.

I at once saw that one of the cables was superfluous; not only that, but that they rendered the picking up of the cables more complex and troublesome. I suggested to Colonel Lay that a relay could be constructed that with one cable should perform these four functions satisfactorily. He embraced the suggestion gladly, and requested me to devise such a relay. It was at once constructed and applied to the boat. It performed even more satisfactorily than the two cables had previously done. It also furnished space for twice the length of cable in the same boat, so that the length of run could be doubled. This relay is peculiar in its construction. It has two polarized and one neutral armature. Each armature has attached to it a retractile spring, so as to pull it back from its point of forward contact. Of the polarized armatures, one is moved by the positive current and the other is moved by a negative current. These positive and negative currents may be strong or weak according to the purpose which is intended to be accomplished by the use of them.

There is a third armature called a neutral armature, which may be used by either a positive or negative current, which moves the polarized armatures. One of these, for instance the positive, serves to open and close the circuit of that electro-magnet which moves the tiller or rudder to starboard. The other polarized armature similarly serves to open and close the circuit of that electro-magnet which moves the tiller to port. The third or neutral armature serves to shift the circuits from the magnets which move the rudder to port or starboard to the circuit of the magnets which serve to open or close the valve which allows the gas to pass to the engine or motor which propels the boat, so a strong, positive current may serve to start the motor into action by opening the valve which supplies the gas for the propulsion of the engine. A strong negative current may serve to shut this valve and thus stop the action of the motor and the further progress of the torpedo. These two latter functions were formerly performed by the second cable, which is thus rendered unnecessary.

Several boats were constructed with this relay, and I afterward made an improvement upon it by which seven functions—viz., start, stop, go to port or starboard, dive

or rise, and fire at will,could all be performed through a single cable. A boat with this improved relay was afterward constructed, about the year 1874, and taken to Egypt; but owing to the unskillfulness of those in charge of the matter, the boat was blown up and went to the bottom while preparing for an exhibition before the Khédive and his officers. The boat was never recovered, and thus the expedition resulted in seeming failure.

A number of boats were afterward constructed for the Russian Government, under the superintendence of Mr. F. Keefe, which proved most satisfactory and were accepted.

Several boats were constructed to be used in South America also. I feel that the Lay torpedo boat, properly constructed and handled, is one of the most valuable contributions to the art that have been made.

At present the Sims-Edison torpedo, which is moved and steered by a current of electricity from the shore, is claiming a great deal of attention under the management of General Abbott at College Point. This is one of the most promising dirigible torpedoes before the public.

Another movable torpedo, not dirigible, called the "Rocket Torpedo," was experimented with while I was at Newport; and I myself saw it move something more than a thousand feet at a speed of one hundred miles an hour. It would be utterly useless to attempt to guide the course of such a torpedo from the shore while it is running. One can simply give it an initial direction, and trust to its construction and the impulse given to keep the proper direction to the end of its course. It is hardly worth while to attempt to guide a torpedo from the shore at greater distances than a half mile, when the speed shall much exceed twelve miles an hour. The capabilities of these self-moving torpedoes are being very thoroughly investigated by General Abbott at College Point.

Another torpedo, called the "Spar Torpedo," was very extensively experimented with at the Torpedo Station, and attained a very high state of efficiency.

The process of exploding a torpedo by a platinum wire is a simple one. It is well known that a current of electricity, flowing through a conductor, generates heat in proportion to the square of the current thus flowing. Heat is also generated in proportion to the resistance of the conductor through which the current flows, and it is also well known that this resistance increases as the resistance of the conductor increases A little implement called the igniter is used for firing the torpedo. Into this igniter are inserted two leading wires, which are used for the purpose of carrying the current into and out of the igniter. Between the ends of these leading-in wires is inserted a short piece of platinum wire, one quarter of an inch in length and one one-hundredth of an inch in diameter. The ends of the platinum wire are soldered to the ends of the leading-in wires. The platinum wire is then wrapped with or imbedded in a small mass of gun cotton, because this is very readily ignited by the heated wire. So much of this igniter is then inserted in a hollow wooden plug, and dynamite is packed around the gun cotton in contact with it. When a slight current of electricity is passed through this platinum wire it becomes heated as long as the current flows, and if the heat generated cannot escape the temperature of the wire rises toward or above the temperature of incandescence. In this way the gun cotton is set on fire and that in turn sets on fire the dynamite, the explosion of which ignites the gunpowder or other explosive with which the torpedo is filled and in which the igniter is imbedded. The current required is very slight in amount and its action is very quick, lasting only the small fraction of a second for the explosion of any torpedo from the smallest to the largest. Several, even many,of the igniters can be coupled together in multiple arc and thus a great many torpedoes can be fired simultaneously. This was well illustrated in the blasting out of the rocks at Hell Gate since, when many igniters were simultaneously fired and the work of the destruction of the rock was accomplished in a very brief instant. A few words may here be said about the arrangement of torpedoes so as to float at constant depth. If the torpedo be provided with a manometer which shall, at a given pressure, open and close an electric circuit, this circuit can operate a motor which by its action shall raise or lower the torpedo, according as it is designed to operate. Thus, if the manometer be so arranged as to close a local circuit, say at a depth of twelve feet, it can be made to operate so as to keep the torpedo at exactly that depth. For instance, suppose when the torpedo is at the surface and no pressure is at the manometer it shall close a local circuit which shall work a screw or other device, which shall paddle or move the torpedo to a depth of twelve feet below the surface. At this point the manometer breaks the circuit and thus prevents the further descent of the torpedo until the circuit is closed, which happens as soon as the torpedo has risen somewhat above its present level. Thus, by a series of oscillations up and down, the torpedo is maintained at nearly the level for which the manometer is set.

On a battlefield torpedoes can be arranged with their circuit closers properly placed, buried beneath the surface so that in the course of the marching of an army some soldier shall tread upon a circuit closer that is buried beneath the surface, so as to explode one or more torpedoes and thus destroy a greater or smaller number of soldiers. This seems cruel, but all war is cruel, and that which soonest brings it to its termination is the least reprehensible means to be used.

Aside from the application of electricity to movable torpedoes, it has recently been introduced quite extensively in the manipulation of heavy ordnance. A whole broadside can be fired simultaneously by the aid of electricity very much better than by the older methods. In the near future it may be expected that the electromotor will be summoned to perform much of the drudgery that has heretofore been performed by the main strength of the soldiers, mariners and sailors. It may be expected to hoist and lower the sails, to shift the position of spars, to move heavy ordnance from one position to another, and thus render the labor of a fighting ship in action much less onerous than in former times.

Another important application of electricity is that of the search light. Very powerful lights can easily be manipulated and used where old-fashioned lights would be valueless. It can be used for the various colored lights employed in steering vessels; also for signaling from ship to shore or from ship to ship. Easily interpreted signals or messages can be sent to a greater distance than twelve miles, as was proved by my experiments at Nahant in 1859, and as shown later by experiments between Newport and Rocky Point about 1877. When a message was written at Newport and transmitted by flash lights to Rocky Point and there copied down and brought back to Newport, the message received at Rocky Point was found to agree exactly with the message sent from Newport. Messages were also easily read when signals were flashed upon the clouds high up in the air. These could be readily understood, even when transmitted to greater distances than twelve miles.

I have thus briefly given in outline an account of the application of electricity to warfare in this country up to 1880. Since then the science has made great strides and is rapidly coming into use, especially for naval purposes. For army use on the field of battle its applicability is very remarkable. A properly constructed line of telegraph can easily be laid down and as readily be taken up, making it possible to communicate from any portion of the battlefield instantaneously.

A series of forts can thus be held in communication with one another, and this instantaneous intercommunication may often secure victory when without it defeat would be certain.

Great has been the progress made in the nineteenth century, but I predict a greater stride in the near future which shall render wars and fightings and naval battles unnecessary, when Peace shall fold her white wings not only over our own beloved land, but over every other nation of this earth, and men shall learn war no more because every man shall know and recognize his brother man, and all men shall know the Lord from the least to the greatest.

CHICAGO, ILL.

HOUSEHOLD USES OF ELECTRICITY.

BY GEORGE N. HOPKINS,
OF "THE SCIENTIFIC AMERICAN."

Science has provided man with many inanimate servants, comparatively few being the inventions of earlier ages, the more numerous and important ones belonging to our own times; among these, obviously the servants actuated by electricity stand pre-eminent, not only as the latest development of energy, latent and almost unknown in the ages of the past, but as the most generally applicable and manageable of all agents for doing work; and while in its present stage it is not a true prime mover, being dependent upon water power, wind power and steam, it serves as an efficient translator and distributor of other forces, so that it can be made to do not only much of the drudgery of life, but to perform the small tasks of every day.

The dwelling without electric bells, electric gas lighters, burglar alarms, the District Telegraph for summoning timely aid in the person of the District messenger, the police, or doctor, or that is still without the telephone, is far behind the age, while the house having all these, in connection with electric lights, motors for driving the sewing machine, water pump, clothes wringer, the mangle, the dumb waiter or elevator, is only fairly modern; but to be strictly up with the times the house must be provided with electrical cooking, water-heating and house-warming apparatus. It must have synchronous electric clocks in all the rooms, and it must also be provided with electric registers for recording certain operations in the house, such as the opening and closing of doors, safes or cabinets, and similar uses, for indicating the level of water in tanks, driving ventilating apparatus controlling temperature and the flow of air, for locating a fire, should one occur, and turning on water for extinguishing it; at the same time sending the alarm to the Fire Department. The electrical piano may take a place in every house; it will be operated by a first-class performer by means of a master piano at a central station, which will distribute the music throughout a large district; and it is not too much to expect that the more pretentious homes may be provided with a full orchestra operated in a similar manner from a distant station.

The story of the summer outing will not be complete without a full line of lantern transparencies, which necessitates an electric lantern for throwing them upon the screen. Every dining table will be provided with electrical heaters and coolers, by means of which coffee, tea and other liquids may be increased or diminished in temperature to suit. Where smoking is admissible, electric cigar lighters come in, in place of the old-time match. The hall and conservatory will be provided with electric fountains illuminated at night by electricity, and in the conservatory and garden, the shrubs and flowers will be illuminated by small lamps placed within the flowers and among the leaves and branches. Electrical clothes brushes and carpet sweepers are forthcoming; possibly a toothbrush in which the necessary movements are produced by a suitable electric motor, might be a desideratum.

The drawing room, and in fact the entire interior, will be ornamented by means of electrical devices, some of them depending more or less upon electrical illumination, while the others require the current merely for producing certain motions. The illumination of pictures will be effected by small lamps inserted within frames of such construction as to throw the light upon the picture and at the same time screen the lamps from view, so that the pictures may be fully and artistically illuminated, while the light in the gallery is made soft and subdued, thus permitting of concentrating the entire attention upon the pictures which will then be seen to the best advantage.

It is not improbable that ere long the lady of the house will be enabled to see from within a visitor at the door, through the medium of electric wires, and that the weight and general dimensions of the person may be appreciated at once, so that the desirability of a personal interview may be determined upon in advance.

By a modification of some of the existing autographic telegraphs, or by a new invention of the same class, a letter written in one home can be instantly transmitted to another at a distant point, thereby outdoing the most efficient mail service. With the current accessible, it is not improbable that every family will have its electrical carriage always ready to roll out on the street and travel a number of miles without fatigue or danger.

Where the house is not fully modernized, and the occupants persist in burning coal locally in the furnace or range, instead of having it burned more economically at a central station, the heat now wasted will be utilized to the last degree in generating currents for lighting purposes and for power. The feasibility of this scheme has already been demonstrated, and improvements are constantly being made, which without doubt will result in final success.

NEW YORK CITY.

ELECTRICAL ENGINEERING.

BY FRANCIS B. CROCKER,
PROFESSOR OF ELECTRICAL ENGINEERING, COLUMBIA COLLEGE, NEW YORK.

Special courses in electrical engineering, or courses of mechanical engineering in which a considerable amount of electrical engineering is taught, are now provided for in most of the large colleges in the United States; for instance, at Harvard Institute of Technology, Columbia College, Cornell University, Princeton, Johns Hopkins, and very soon at Yale; also, the Stevens Institue of Technology, New Jersey, and a large number of Western colleges and State universities. But, after all, the number of institutions in which a young man can obtain a first-class course of electrical engineering is limited; I do not think there are over half a dozen in the United States. Practically, until the last three or four years there were no special courses of electrical engineering. Only a very few students at first applied for admission to such courses; but now, in colleges in which this course has been established they have, on an average, from twenty-five to one hundred students. In the department at Columbia College, at the present time, we have about seventy students, and in several other colleges the class will number fifty or more.

Young men begin the course of electrical engineering usually at the age of eighteen. They must be well grounded in arithmetic, algebra, geometry, and plain trigonometry, elementary chemistry and physics, English grammar, history, elementary free hand drawing, and be able to read easy French and German. The course of study in the colleges where this profession is taught differs considerably. In some colleges more attention is given to the subject of electrical engineering as distinct from mechanical engineering, or physics. At Columbia the regular course covers four years. The studies during the first year are: trigonometry, physics (heat), sound, chemistry, qualitative analysis, drawing, algebra, analytical geometry, descriptive geometry, physics (magnetism, electricity, light). During the second year: analytical geometry, calculus, graphics, hygiene, applied chemistry, physical laboratory, drawing, elements of electrical engineering. During the third year: analytical mechanics, engineering, properties of materials, dynamo and motor (practical), theory of dynamo and motor, electrical measurements, electrical engineering laboratory, drawing, designs, electrical engineering, electric lighting. During the fourth and last year: machinery and

mill work, mechanical engineering, engineering design, dynamics of engineering, heat and its applications, electric power, theory of alternator and transformer, electrical engineering, electrical engineering laboratory, drawing-constructions, electro-dynamics, potential theory, thesis.

In addition to this course there are postgraduate courses for advanced work in electrical engineering in which graduates receive the degree A.M. or Ph.D. These courses cover, respectively, one and two years, and are largely occupied in the advanced theory of electricity and magnetism; the theory and phenomena of high frequency, alternating currents and oscillating electric currents, long-distance transmission of electric power, etc.

Electrical engineering is an excellent profession for young men; but any one who enters it simply because he has no taste for any other work, or because he thinks it is an easy way to make a living will be disappointed. The young man who would succeed in this profession ought to have a strong taste for machinery, and a liking for exact facts. A dreamer would never succeed. It must be remembered that electricity is a very definite, practical force, and it requires a careful, exact man to deal with it.

The young man who studies electrical engineering with the intention of working hard, and who really takes considerable interest in the study, is almost sure of being successful. His promotion in this profession will probably be much more rapid than in any other line of work he could find. The failures in electrical engineering are in the cases of men who have had imperfect or little preparation, who have not been ambitious to succeed or who have been lacking in industry. There are numerous cases of that sort, as indeed there are in any profession. My experience teaches me that young men generally get along better and faster in electrical engineering than they do in other professions. But that does not mean, by any manner of means, that a young man makes a fortune in a year or two. Each of the five members of the first class which graduated two years ago from the Columbia College department of Electrical Engineering, now has a first-class position and is making a very good living.

Progress in this profession has been so rapid that a young man must work hard in order to keep up with the advance; the man who is lazy or dull cannot possibly do this. And it may be said that almost all of the men who have made any success in electrical matters are of the quick-witted sort.

It is almost practically impossible to become thoroughly acquainted with the subject of electricity from text-books. While a man would be studying a text-book it would become antiquated in its statements, so rapidly are discoveries being made. In colleges, where the professors keep up with the subject, they explain the statements in the text-books and point out the progress that has been made in the special subject under consideration. Young men who want to keep abreast of the subject also read the electrical journals which are, of course, up to date and very good as far as they go.

Altho there are many books upon this subject I am sorry to say there are not more than a dozen first-class works on electricity or its application. There are, of course, a few valuable books on some of the special and more or less settled subjects, such as the dynamo, the electric magnet, etc.

Electrical engineering embraces a knowledge of electrical principles, laws, etc., electrical measurements, dynamos and motors, electric lighting, transmission of power, storage batteries, telegraphy, telephony, electro-chemistry and electro-metallurgy.

In addition to these requisites for electrical engineering are a theoretical and practical knowledge of mathematics, mechanics, physics, chemistry, the principles of engineering construction, a good knowledge of mechanical engineering, particularly the steam engine and transmission machinery.

Electrical engineering has become such a difficult subject to master that it usually requires a regular course at some scientific school thoroughly to prepare a young man for the profession. It must be remembered, however, that a man should obtain a certain amount of practical, or rather industrial experience in some electrical station, before he is qualified to assume any considerable responsibility, or be entitled to receive a fair salary. But this period of service need not be over six months or a year in the case of a practical young man who has had a good preparation.

On the other hand, if a man goes directly into practical work without the college preparation, it will take him many years to pick up even a superficial knowledge of electricity, and it is very difficult if not impossible for him to get a general or thorough knowledge of the subject in ordinary industrial employment.

ELECTRICAL STOCKS AND BONDS.

BY GEORGE W. ELY,

SECRETARY N. Y. STOCK EXCHANGE.

The list which I have prepared and give below contains the names of the different electrical stocks and bonds dealt in at the New York Stock Exchange. These stocks, and industrial stocks, form a large per cent. of the transactions among brokers; in fact, recently such stocks have been dealt in more largely than railroad stocks.

TITLE OF CO.	Originally Listed.	Stock.	Amount now on List.
Southern Atlantic Tel. Co.....	Dec. 13, 1876	Stock	$948,775
Northwestern Telegraph Co....	Sept. 28, 1881	Do.	2,500,000
Mexican Telegraph Co.....	Mch. 10, 1886	Do.	2,000,000
Commercial Cable Co.....	Sept. 25, 1889	Do.	7,716,000
Edison Elec. Illum'g Co. of N. Y.	May 8, 1889	Do.	6,100,000
Do. Do.	June 25, 1890	Bonds	3,250,000
Met. Telegraph & Telephone Co.	Oct. 8, 1890	Do.	2,000,000
Central & South Amer. Tel. Co.	Aug. 12, 1886	Stock	6,500,000
General Electric Co.....	June 23, 1892	Com. do.	30,426,900
Do.	July 1, 1892	Pfd. do.	4,236,900
Do.	Dec. 28, 1892	Bonds	10,000,000
Interior Cond. & Ins'lation Co..	Jan. 11, 1893	Stock	1,250,000
Edison Elec. Illum'g Co., B'klyn	Sept. 28, 1892	Do.	1,500,000
Do. Do.	Do.	Bonds	500,000
Westinghouse Elec. & Mfg. Co..	Apr. 26, 1892	Stock	3,755,700
Do. Do.	Do. Assg.	Do.	5,333,940
American District Tel. Co.....	Sept. 15, 1873	Do.	3,825,000
Bankers' & Merchants' Tel. Co.	Dec. 13, 1882	Do.	3,000,000
Western Union Telegraph Co...	.....	Do.	94,820,000
Do. Do.	Oct. 24, 1888	Col. T. 5s	8,287,000
Do. Do.	July 15, 1889	Deb. 7s	1,000,000
Do. Do.	Sept. 7, 1875	Do.	3,840,000

THE LITERATURE OF ELECTRICITY.

BY W. A. BARDWELL,

LIBRARIAN OF THE BROOKLYN LIBRARY, BROOKLYN, N. Y.

One of the most striking features in connection with this age of electricity is the wonderfully large and rapid growth of books and pamphlets bearing upon the subject. I cannot recall any topic which has been the subject of discussion where the growth has been larger within the same space of time. Thousands of books have been published on the subject of theology, and biblical history, criticism, etc.; but they have appeared in periods covering a hundred years or more; the vast literature that has grown out of this subject has been published within the last quarter of a century.

One reason for this remarkable growth is the fact that the subject itself has been divided into so many branches, and is daily becoming more and more specialized. Taking the Brooklyn Library as a fair sample of a library serving the interests of general readers we find upon its shelves about fifty books devoted to the general subject of the telegraph; nearly one hundred treat of the electric light, electrical measurements, electricity, galvanism and magnetism; about twenty-five works are on the subject of electricity, galvanism and magnetism, as applied to medicine; nearly fifty have reference to the subject of animal magnetism, and there are many others treating specially of thunder, lightning, lightning rods, electro-metallurgy, electrical engineering, the telephone, the phonograph, electricity in land and naval warfare, the making and laying of ocean cables, electric railways, electric lighting, electric motors, and many special treatises and monographs having reference to the use of electricity in the practical affairs of life. A large number of text-books for the use of those engaged in the business have been published and are constantly being put upon the market. In addition to the books in the regular printed catalog there are nearly two hundred additions in the card catalog, all of which have been published within a very few years. The wonderful and rapid progress made in this science is illustrated by the fact that one text-book has scarcely been off the press before new discoveries have been made which often materially alter the statements that have been printed by the authors. Indeed, it may be said, and it is said by competent authorities, that there are no electrical text-books absolutely "up to date," and it requires a person pretty well-informed to select authoritative works on this subject. The great growth in this kind of literature has been especially noticeable within the last ten or twelve years.

A leading publisher, who supplies rare books on scientific subjects, has a special catalog of works on electricity—the electric light, the telephone, electric telegraph, electric motors, electric metallurgy, etc. Over seven hundred books are named in this catalog, and nearly all of them have been published within the past ten years. How great the work in the industries growing out of electricity has been specialized, is illustrated by the books that have been published. They might be said to cover every phase of the subject were it not for the fact that new works are being placed upon the market every week. There are, for instance, pocket books of rules and tables for the use of electricians and engineers; a dynamo tender's handbook; a treatise on the law of electric lighting; a book on artificial lighting in relation to health; a treatise on electric light fire risks; an essay on the application of mathematical analysis to the theories of electricity and magnetism; a guide to the correction of errors in code and other telegrams, containing seventy thousand examples; domestic electricity for amateurs; a book containing a table of electric conductors, showing the relation between (1) the sectional area, diameter of conductors, loss of potential, strength of current and length of conductors; (2) the economics of incandescent lamps, their candle power, potential, and strength of current; (3) the sectional area, diameters of conductors and strength of current per square inch; the theory of magnetic measurements; the storage of electrical energy and researches in the effects created by current combining quantity with high tension; the Military telegraph during our Civil War; workshop receipts; devoted to electrics, alarms, batteries, bells, carbons, coils, dynamo electric machines, measuring, microphones, motors, phonographs, photophones; a phrase book, giving a code of cypher words for commercial, domestic and familiar phrases in ordinary use in inland and foreign telegrams; books on the electrolysis of gold, silver, copper, nickel and other metals and alloys; electric light cables and the distribution of electricity; handbooks for working electrical engineers, embodying practical notes of installation management; a guide to the testing of insulated wires and cables; a dictionary of electrical words, terms and phrases; books on the theory of electrical measurement; the principles and practice of electrical power transmission.

These books—only a few of hundreds that could be named—will give the reader some idea of the diversity of the literature of the subject and show how thoroughly it is being treated by the expert writers of the time.

There are in the United States six well-conducted weekly periodicals devoted to the subject of electricity, five of which are published in the city of New York. These journals confine themselves strictly to topics of an electrical character, and never publish an article unless it directly bears upon some branch of the general subject. All of them make a specialty of giving quite full reports of the proceedings of the different electrical organizations in the various States, printing in full, or giving long abstracts of, the important papers that are specially prepared for such bodies, and are read before them. Many of the States have street railway organizations, at whose meetings the subject of the uses of electricity is largely discussed.

There is a National Association of Electricians, with members from all of the States. Then there is a National Electric Light Association, which meets yearly in February, and the delegates to which are members of electric lighting firms. The method of joining this organization is largely a formality, each member paying a certain fee and attending the meetings, or not, just as he sees fit. At these meetings papers are read and discussed, the topics being on the general subject of the electric light in all its branches.

There is also the American Institute of Electrical Engineers. This is a technical organization, which has two classes of members; the first class consists of those who are electrical engineers of experience, having a knowledge of the practical application of the theory; and a second class of associate members who are not professionals and experts, but who take more or less interest in electrical matters.

In each of several large cities, notably New York, Chicago, Boston and St. Louis, there is an electrical club before which interesting papers are occasionally read. The New York Electrical Society is distinct from the other organizations mentioned, and papers are once in a while read before this body.

The reports and doings of these societies furnish considerable interesting and valuable material for the electrical journals. Reports of lawsuits having reference to the validity of a patent in regard to some important branch of electrical machinery, or relating to the question of priority of invention, are always read with keen interest by the patrons of these journals, a large portion of whom are either inventors themselves, or pecuniarily interested in some electrical project. At the present time these journals are devoting a great deal of space, both editorially and in their news columns, to the law suit which the General Electric Company has brought against outside lamp manufacturers. This suit involves the validity of a dozen patents, and will be before the courts for some time. The telephone has been a subject of litigation ever since Bell obtained his patent. New discoveries, as described in the papers read before the American Institute of Electrical Engineers are always discussed in the journals *pro* and *con* by professional writers and general correspondents. Difficult problems that are met with by electrical engineers, in the course of their work also receive attention. Inventors describe their inventions, sometimes through the technical societies or directly through the electrical papers.

An indication of the interest taken by readers in this class of publications, and an illustration of the enterprise shown in their special field, is the fact that one of them, *The Electrical World*, receives, from time to time, cable dispatches from abroad in regard to important electrical subjects, improvements in electrical apparatus and the outcome of interesting lawsuits. There are also employed by these journals regular correspondents in all the leading cities of the United States and Europe, who write fully on new topics, thus keeping the readers in touch with the subject all over the world.

One feature of the electrical newspapers is that while each of them covers the same field, generally, they make it a rule never to reproduce in their own columns any article which has been previously produced in the pages of one of their contemporaries. They will publish the same article simultaneously, and they will copy articles from foreign electrical journals; but they are very strict in adhering to the custom mentioned. It may be stated here that probably the first electrical publication in the Japanese language is the *Journal* of the Electrical Society of Tokio, which has recently been issued. English mathematical formulæ and characters are used, and these are strung up and down the pages in perpendicular fashion to correspond with the rest of the type. The symbol used to signify a dynamo-machine closely resembles a music stand such as is used in a theater orchestra.

Not only do the journals on this subject published in this country have a large circulation, but it is found that there is a great demand for electrical periodicals published abroad. There are the *English Electrician* (weekly, subscription $6); *L'Industrie Electrique* (semi-monthly, $6); *Electrical Review* (weekly, $3); *La Lumière Electrique* ($13); and the *Revue Internationale de L'Electricité* (monthly, $6).

The great increase of electrical literature has led one of the class journals to employ a well-educated electrician whose duty it is to specially edit the department of "books received." He furnishes an abstract of current electrical literature which covers everything of importance that has been published during the preceding week. This is done for the purpose of saving time and expense to the general reader, who would otherwise be constantly duplicating information that had already been published.

Tho not exactly germane to this subject it is curious to note that a new profession, or rather a new branch of the legal profession, has lately grown out of the application of electricity, and that is the lawyer who makes a specialty of electrical cases. It requires a man who has been thoroughly trained and educated in electrical matters to succeed in this profession. Young men, after having familiarized themselves with the technicalities of electricity as it is applied in its various forms, graduate as electrical engineers at some college where the profession is taught, and afterward take the usual legal course at a law school. They are then ready to take cases involving the rights of patentees of electrical inventions, and in the years to come, judging from the litigation there has already been before the courts upon such subjects, they will not lack for employment.

SOME UNPUBLISHED LETTERS OF WILLIAM WORDSWORTH.

BY JAMES PAYN.

BEFORE me lie a large number of Wordsworth's unpublished letters, and in turning them over, one is impressed by their honest simplicity and directness of purpose, their sincerity and warmth of expression, and the intense solicitude they evince for the well-being of those to whom they are addressed.

They also present to one's notice other characteristics which the reader will be quick to observe. Very noticeable, for instance, is the complete absence of playfulness, or anything approaching a sense of fun in any one of the series (there are more than forty), all written to members of the immediate family circle, and some under circumstances that would naturally have given rise to a jest, a light word, or a merry turn to a sentence, had the inclination, or, shall we say, the capacity of the writer tended in any way in that direction.

But then, who could realize a *humorous* Wordsworth? Search his works through and through, and the poem containing the faintest glimmer of humor remains yet to be discovered. It is as well to note his peculiarity in this respect, because we at once recognize that, had his nature been endowed with the slightest touch of appreciation for the ludicrous, we might have been spared many a jangling note, many a jarring discord which has clashed with the sweet music we love so well.

Here is the postscript of a letter to his daughter Dora:

"DEAREST DORA, your mother tells me she shrinks from copies being spread of those Sonnets; she does not wish one, at any rate, to be given to Miss Gillies, for that, without blame to Miss G., would be like advertising them. I assure you her modesty and humble mindness were so much shocked that I doubt if she had more pleasure than pain from these compositions, tho I never poured out anything more truly from the heart."

The lines alluded to in the concluding words of this letter are probably those addressed to his wife, beginning:

"Oh! dearer far than light and life are dear,"

for in the same poem he afterward comments on her diffidence:

"That sigh of thine, not meant for human ear,
Tells that these words thy humbleness offend," etc.

Yet the praise bestowed upon her strikes one as being founded mainly on her qualifications for being a sympathetic mate for himself rather than on her individual merit. This is certainly his meaning with regard to her personal appearance:

"Heed not tho none should call thee fair,
So, Mary, let it be,
If nought in loveliness compare
With what thou art to me," etc.

Mrs. Wordsworth, with all her beauty of expression, was undoubtedly a plain woman; and this is what may be called putting the fact into plain language. But if she could make no boast of good looks, neither was the poet himself remarkable for beauty of feature or comeliness of form; while his extreme inattention to little matters of detail in dress was always more or less marked. I cannot forbear quoting an amusing incident lately told me by an old friend (a grand-niece of Mrs. Wordsworth) who, when a child in her parents' home at Durham, remembers one afternoon an announcement being made to her mother that a man wished to speak to her; and that, as he appeared very tired, and seemed to have walked a long distance, he had been accommodated with a seat in the kitchen. My friend's mother, like most country residents, was not unaccustomed to interviewing people of all sorts and conditions, and having finished the letter upon which she was engaged, proceeded leisurely to the kitchen, expecting, perhaps, some application for employment, or, possibly, to hear a tale of sickness or distress among her humbler neighbors. Her dismay may be imagined when, seated hat in hand upon a Windsor chair, and absently contemplating the weights of the Dutch clock upon the opposite wall, she discovered the Poet Laureate.

My informant, who was scarcely of an age to appreciate the beauty of the poet's conversation, confesses to an industrious tho fruitless attempt on her part to count the number of buttons missing from the distinguished visitor's gaiters on this interesting occasion.

The marriage of their only daughter, Dora, was a severe trial to the poet and his wife. Mr. Quillinan, of Portuguese extraction, and himself a poet of some pretension, was a widower with two little girls. His first wife was the daughter of Sir Egerton Brydges (of whom Carlyle says, "he has a small vein of real worth in him, and knows several things"), and he must have been considerably older than Dora; but the main objection advanced by her parents to the marriage was on the grounds of his being a Roman Catholic.

Among the papers are two short letters touching this subject, which are here transcribed. It will be seen that notwithstanding the fatherly affection conveyed in them, there exists also a strong current of objection underlying and qualifying his expressions of satisfaction.

"Sunday morning, Nine o'clock.

"MY DEAREST DORA:—I am looking for Mr. Quillinan every moment. I hope to revive the conversation of yesterday.

"The sum is:—I make no opposition to this marriage. I have no resentment connected with it toward any one; you know how much friendship I have always felt toward Mr. Q., and how much I respect him. I do not doubt the strength of his love and affection toward you; this, as far as I am concerned, is the fair side of the case.

"On the other hand, I cannot think of parting with you with that complacency, that satisfaction, that hopefulness which I could wish to feel; there is too much of necessity in the case for my wishes. But I must submit, and do submit; and God Almighty bless you, my dear child, and him who is the object of your long, and long-tried preference and choice.

"Ever your affectionate father,
"WM. WORDSWORTH.

"I have said little above of your dear mother, the best of women. O how my heart is yearning toward her, and you, and my poor dear sister.

"My ankle is rather worse this morning than yesterday at this time. Would that the next week were fairly over!

"I enjoyed the Ballet of the Opera last night.

"Thursday.

"Your letter to me just received. Thanks; I will write from Brinsop—W. W.

"MY DEAR DAUGHTER:—The letter which you must have received from Wm. has placed before you my judgment and feelings; how far you are reconciled to them I am unable to divine. I have only to add that I believe Mr. Q. to be a most honorable and upright man, and further, that he is most strongly and faithfully attached to you; this I must solemnly declare in justice to you both; and to this I add *my blessing upon you and him*—more I cannot do, and if this does not content you with what your brother has said, we must all abide by God's decision upon our respective fates. Mr. Q is, I trust, aware how slender my means are; the state of Wm.'s health will undoubtedly entail upon us considerable expense, and how John is to get on without our aid, I cannot foresee. No more at present, my time is out; I am going to join Miss Fenwick at Miss Pollard's.

"Ever your most tender-hearted and affectionate father,
"WM. WORDSWORTH.

"In a beautiful churchyard near Bath, I saw the other day, this inscription:

THOMAS CARROL, ESQ.,
BARRISTER AT LAW.
Born—so, died—so,
Rest in peace, dear Father.

"There was not another word."

One can hardly avoid commenting on the curiously irrelevant nature of the postscripts appended to these two letters, called forth by a circumstance so near to the father's heart, and presumably written under high pressure. That in the former, especially, referring to the Ballet at the Opera, strikes one as being particularly out of keeping with the feeling of the few lines above it. Evidently the "Order of Things," upon which Oliver Wendell Holmes so frequently insists, had little place in the poet's mind, a noticeable fact, not only in this, but in many other instances, where his want of a certain sense of congruity now and then occurs to us.

Some of the early letters from Wordsworth to Quillinan are extremely friendly; they were evidently written before the latter had presented himself definitely in the light of a future son-in-law to his mind. The allusion to his "disappointment," in a letter already quoted, coupled with the recommendation to his wife and daughter to have "nothing to do with Quillinan," was probably occasioned by one of Dora's repeated refusals of his suit.

But it is to be presumed that the Wordsworths, altho not desirous of connecting themselves by marriage with the Quillinan family, always took an intimate and kindly interest in the children.

Mrs. Quillinan's tragic end (she died from shock to the system, consequent on a narrow escape from death by burning) would naturally dispose them to look with a friendly and compassionate eye upon her motherless children, and especially on the forlorn little baby; to whom Wordsworth, notwithstanding the difference in creed, was induced to stand godfather, and whom he called Rotha, after the beautiful river Rotha, whose banks he loved so well.

It was not for some considerable time, however, that Dora consented to become Mr. Quillinan's wife, and she died a victim to consumption, only a very few years after her marriage.

The following letter addressed to Mr. Quillinan, accompanied one by little Rotha, to her father:

"MY DEAR FRIEND:—I cannot suffer this letter to go without a word from me: and first of dear Mrs. Wordsworth—her complaint is lumbago and sciatica, the younger sister and scarcely distinguishable from tic-doulereux. But here my poetical reputation served us. I knew no one in Nottingham, but bethought me of the Howitts. There are two brothers of them—on one I called to state my situation, and found that there was a third Brother, a Physician. Him I sent for, and William and Mary Howitt insisted on the invalid being brought to their house, which was a great comfort on the eve of an Election. We made one attempt to move her in vain, in the afternoon we succeeded, and she passed through the wide Marketplace of Nottingham, wrapped in a blanket, she could not be dressed, and in a chair, followed by a 100 boys and curious persons. So that she preceded Sir Thomas Denham and Ferguson in the honor of being chaired, and was called by us Parliament Woman for the loyal Borough of Nottingham.

"As to Rotha she is a sweet, clever child, and we were the best companions in the world. As Miss H. says, we must take care not to spoil her; she is wonderfully intelligent.

"God bless you. I am called away.

"Ever faithfully and gratefully yours,
"W. WORDSWORTH."

This little incident of Mrs. Wordsworth's illness and removal to the Howitts' house is duly recorded also in Mary Howitt's pleasant autobiography. She speaks of the year 1831 as "a memorable one" to her, by reason of the Wordsworths' visit; but we will give it in her own words:

"This day week, as we were dressing in the morning, Mr. Wordsworth was announced. He was on his way from London, and Mrs. Wordsworth, who was with him, was taken ill on the road, and had arrived in great agony in Nottingham, the night before. He came, poor man, in much perplexity to ask our advice. We recommended that Godfrey should see her, and insisted on her removal to our house, which was accomplished with some difficulty the same afternoon. Here she has accordingly been since; she has now nearly recovered. Wordsworth greatly pleased me. He is worthy of being the author of "The Excursion" and "Ruth," and those sweet poems of human sympathy. Not less are we pleased with Mrs. Wordsworth and her lovely daughter, Dora.

"They are the most grateful people; everything we do for them is right, and the very best it can be."

LONDON, ENGLAND.

THE END OF THE HAWAIIAN MONARCHY.

BY THE REV. THOMAS L. GULICK.

MRS. DOMINIS, commonly known as Queen Liliuokalani, has knocked the foundation from under her throne, and is now in private life repenting of her folly.

On ascending the throne, two years ago, she took a solemn oath to uphold our excellent Constitution. This ordains that a Cabinet can be dismissed only by a vote in the Legislature of want of confidence.

A Cabinet had been appointed which the whole country trusted, and which the Queen hated because she could not bend them to participation in her plots against the liberties and morals of the people.

After unsuccessful attempts by bribery to turn out the Cabinet, one of the Queen's most confidential friends and advisers told a member of the Cabinet that when the Legislature was prorogued the Queen would require her ministers to sign a new Constitution which she would proclaim, embodying her own ideas of royal prerogative; that if they refused to sign she would demand their instant resignation; that if they refused to resign she would imprison them.

The Cabinet were not in the least terrified. Seeing their resolute temper, renewed efforts were made in the Legislature to unseat them. By wholesale bribery she was at last successful, and immediately appointed a Cabinet of her most servile followers.

An infamous bill, licensing a national lottery, was now rushed through the Legislature by the most unblushing bribery. One member was offered a salary of $10,000 a year to use his influence for the lottery, and refused the bribe.

The bill was engineered and pushed forward from the palace. More petitions had been presented against this lottery scheme than against any other measure ever proposed in our Legislature. Every pulpit denounced it; the Chamber of Commerce protested—all in vain. The Queen was petitioned not to sign the bill, but she made haste to do so the very day it was passed.

January 14th the Legislature was prorogued. The Queen now appeared to be entirely triumphant, with no

possible legal check upon her. For two years there was to be no Legislature. The infamous bill to license opium had been passed by bribery, and would soon put us into the position in which England has put India and China. The country was bound hand and foot for two years, to be governed by a gambling ring, delivered over by the Palace cabal to the devils of bribery, lottery and debauchery.

The same afternoon, January 14th, the Queen, still glittering in the coronet of diamonds and gorgeous in the dress in which she prorogued the Legislature, summoned her servile ministry to the palace, and demanded that they should immediately sign a new constitution, disfranchising over one-fourth of the voters and the owners of nine-tenths of the private property of the kingdom, abolishing the Upper House of the Legislature and substituting, in place thereof, one to be appointed by the Sovereign.

The puppet ministry were extremely anxious to please the Queen in every way possible, but they simply did not dare to sign this bogus constitution, abrogating the one which the Queen and they had taken oath to sustain, which was the foundation of her authority. When she found she could not induce them to sign, she flew into a passion and openly declared she would proclaim her constitution in a few days in spite of them. This was too much for the citizens; they rose in a body, appointed a Committee of Safety, which chose an executive council of four, and an advisory council of fourteen, who now constitute our Provisional Government under the wise presidency of Judge S. B. Dole, while we wait to hear whether the great Republic will receive us.

There has been no loss of life, no riots or disturbance.

The United States Minister did not allow American mariners to land on our soil till asked to do so by the Committee of Safety for the protection of American life and property. He did not recognize the Provisional Government till it was the *de-facto* government, in the possession of the Government Buildings, the National Archives, Treasury, etc., having control of the Capital and the Island.

The new Government is now recognized by all the foreign powers having representatives at these islands.

We trust the people of the United States will see the wisdom, justice and necessity of receiving us to become part of themselves, if they would complete the work of christianizing and civilizing which they began here seventy years ago.

PAIA, MAUI, HAWAIIAN ISLANDS.

SAVANNAH IN WINTER AND IN WAR.

BY THE HON. L. E. CHITTENDEN,

REGISTER OF THE TREASURY UNDER PRESIDENT LINCOLN.

I.

SHERMAN had driven his army, like a wedge of steel, through the body of the Confederate States, from Nashville to Atlanta, from Atlanta to the sea. Hazen had stormed Fort McAllister. Hardee had evacuated, and Gen. Frank P. Blair had led the Seventeenth Army Corps into the city of Savannah, and Sherman had made of that city, with its many thousand bales of cotton, a Christmas gift to the President of the Republic.

With this present came northward a wail of famine and of suffering. When Hardee with the Confederate Army marched out of the city into the morasses of South Carolina, there followed him every wheeled vehicle drawn by every horse and mule, transporting the last barrel of pork and beef and flour and the last bushel of rice. He had left nothing for the subsistence of the people, and they were starving. So ran the report which was almost universally believed.

Straightway the people of New York City, without distinction of party, sect or condition, forgot the firing upon Fort Sumter, the horrors of Andersonville, the almost four years of bloody war, and remembered only that the people of Savannah were Americans and that they were hungry. In a single morning a large committee was named by the Chamber of Commerce to receive contributions of provisions; the committee was organized, a depot named where supplies might be sent, and before nightfall there were contributed provisions enough to load a steamer, the owners of which made her charter their own contribution. She was loaded in the night and the next morning was ready to be cleared for Savannah.

Her clearance involved a difficulty. The War Department objected. "To exhaust the supplies of the enemy," said Secretary Stanton, "is one of the objects we are trying to accomplish; it is one of the most effectual means of making war. To feed him, or to feed the families of soldiers who are in the field fighting our own armies, would prolong the war and make us the butt of other nations. Why do you ask me to do what you would not do yourself in my place?" he asked me when at the request of friends in New York I asked him to permit the steamer to be cleared. "I will not do it. If the people of New York City want to feed anybody let them send their gifts to the starving prisoners in the Andersonville stockade. They shall not with my consent send supplies to the rebels in the very State in which the enormities of that hell are perpetrated!"

I could not answer the Secretary and I wanted to accommodate my friends in New York. I was in a strait betwixt the two, and I had learned what to do in such a situation. I went to the President and laid the case with Secretary Stanton's objections fairly before him. "Stanton is right," he said; "but the Georgians must not be left to starve, if some of them do starve our prisoners. However, I will not offend Stanton unless I can make something by the transaction. I will compromise. If you will go on the steamer and make a report upon the actual condition of the people, I will do better than Pharaoh did by the Israelites—I will let the steamer go."

I accepted the condition and the mission, went to New York the same evening, and as soon as the Custom House was open the next morning, submitted the President's order, obtained the clearance, and by twelve o'clock the vessel was ready to sail.

The manifest of the steamer's cargo was not suggestive of famine nor even of destitution. It was midwinter, when fresh provision could be transported without risk. The hold was filled to the deck-beams with barrels of flour, barrels and other packages of salted and canned beef, fish and vegetables. Smoked hams and bacon were thrown into every crevice. Between the decks, in close proximity, were suspended on hooks the carcasses of fat beeves, calves, pigs and sheep. All the staterooms unoccupied by the Committee and the Commissioner were crowded with layers of turkeys, geese, ducks and chickens. From manifestations after our arrival I was led to believe that there were fluids on board of higher proof than mineral waters.

The captain or skipper of the steamer was an original. He was a native of the eastern shore of New Jersey, and about fifty years of age. He stood six feet high, and carried back and shoulders broad enough and backbone straight enough for two ordinary men. His face was intensely red—his hair bleached from dark brown to a straw color from exposure. His whole life had been passed at sea. He had risen from boy of all work on a coal-carrying schooner, through all the grades to the command of a three-master, from which he had been transferred to a small steamer as mate, and had risen to the captaincy of the largest in a considerable fleet of coasting steamers.

He began by driving his passengers ashore to their homes after what he called decent winter clothing. "You are going around Hatteras in January," he said, "an' that ain't no summer excursion. I don't want to report you frozen to death on my hands. You had better put on all the flannels you've got in your chists, two or three pair of thick trowses, and as many coats. Clap an oilskin suit a-top of them with a buffalo or a fur coat for real lively stirring weather, and you may be happy off Hatteras. Better to lose an hour now than to send you frozen mummies back to the bosoms of your families."

We were glad enough of the captain's foresight before we passed Sandy Hook. It was very cold in New York City, and it grew colder every hour until we entered the mouth of the river at Fort Pickens. The red-heat of the coal stove in the cabin was all absorbed by the circle of shivering landsmen gathered around it, while the captain danced and roared his orders above the howling of the wind in the very exuberance of his animal spirits.

The next day was one of uneventful cold. We were principally employed in keeping warm. At nightfall when we retired to the seclusion of the cabin, the captain informed us that we were off the capes of Virginia. We passed the evening in games of whist and chess. About ten o'clock the captain rushed into the cabin exclaiming: "There's merry mischief to pay in-shore. I think it is another attack on Fort Fisher. I have half a mind to run in and see. It will not cost us more than four or five hours' delay."

We went on deck in a body, the captain not stopping until he reached the masthead. He declared that he could see the flashes of the guns on the southern horizon; we could only hear a dull, heavy roar, now swelling and again falling, but never quite dying away. The flashes of the guns soon became visible from the decks, and in a couple of hours the whole magnificent spectacle was imprinted in flashes and curves of fire upon the southern sky. The curves of fire must have been made by the burning fuses of the shells, one of which occasionally burst in its transit, lighting up the whole scene. The fire from the ships was constant; we were not near enough to see whether it was answered from the fort. We pursued our voyage until the light fell below the horizon, for we had no knowledge how long the bombardment might continue. The dull roar of the guns was heard long after the lines of fire had disappeared.

The next morning we were off Cape Hatteras and the low sandy shore was no longer visible. Mighty seas, overtaking us, threatened to swamp our steamer; but a little in advance of the top of the wave her stem rose gently, the sea rolled under her, and rushed to break into masses of white foam over the shallow bottom that seemed directly in our course. Our captain said there was a channel, very narrow and very crooked, and he was bound to follow it. Glass in hand, he went up to the masthead. From his perch he shouted his orders to the two men at the wheel, turning the bow of the vessel now this way, now that, always keeping it in the narrow space marked by the green unbroken wave. There he stood for three long hours, until our good ship was plowing the unbroken sea, the white foam lay behind us, and we knew the danger was passed.

"You must know this coast well, Captain, to be able to pilot your ship through that crooked channel," I said, as he came down to his post on the bridge.

"I reckon I ort to be," he replied. "I've known her for more'n forty year. I know her bottom better'n I do her shore. Wake me in any watch and show me a bit of her bottom and I'll tell you whar we are!"

"Do you coasters take observations and ascertain your position by the science of navigation?" I asked.

"Sartin!" he replied. "I shall take the sun at twelve o'clock an' show you how it is done!"

He took his observation and proceeded to explain to us the whole science of navigation. His short legs as solid as two iron bars were planted well apart, sustaining his square figure with its big head and well-tanned face. Between the short, stubby thumb and finger of his big right hand he held a shorter and more stubby lead pencil, in the other hand a well-worn copy of Blunt's "Coast Pilot." With some difficulty he found the margin of a page not already covered by the figures of a former example. "You git the sun," said he, "and then you set it down and go into the book and git the logarithm for to-day. And then you multiply and divide and subtract, and then you add fourteen more, and there you are. It's as simple as falling overboard."

"But why do you multiply and subtract and divide in this way?"

"Because them's the right figgers. It's all down here in the 'Coast Pilot,' all a-taunto!"

In short, he had not the slightest conception of the reason of any part of the process. But I presume he would have navigated a ship to any part of the world in perfect safety without any doubt whatever of his own capacity as a navigator.

Before the voyage was over our confidence in the capacity of our captain was settled. As we approached the mouth of the Savannah River he kept the lead going until we reached a point some miles off shore, where there was not more than a half fathom in excess of the steamer's draught of water. Here he anchored and set his signals for a pilot. No pilot came. He got his chart of the river and harbor and spread it on the post of the windlass, and began to survey the shore and soliloquize: "It's risin' three year sence I was here last. The bottom hasn't changed, I reckon. But the blamed rebs have put out every light, cut loose every buoy, and cut down every tree on the shore. What for did they bite off their own noses, I wonder? There used to be a live oak on that point. You steered for the flag on Fort Pickens until that tree bore; then you opened another tree, and steered straight for it until you laid your ship well into the river, opposite the fort. Now there ain't no tree, nor no flag on Fort Pickens. Yes, there is, and they have just sent it up for some reason. It's our flag, too." Thus he went on until it became evident that he must lie on the bar all night or make his own way into the river.

He gave the order to raise the anchor and place one on either bow ready to be let go on the instant. A man was also placed on either side forward with orders to keep the lead going. He put his steamer under a low steam, and she began to move slowly forward. Answering her helm quickly, she moved right, left, forward, stopped and backed at his command. Often there was not more than a foot of water under her keel. But before sunset he had worked his steamer safely into the river almost up to Fort Pickens, when he roared loud enough to be heard on shore:

"Let go them anchors!"

They dropped into the muddy bottom and brought up the steamer under her slow motion in one-third of her length.

"Look there and see what a——rebel can do," he said, pointing over the steamer's bow. We looked and saw nothing but a small spar one end of which appeared to be floating abreast of our vessel. He sent a boat with a line to take a turn around it and haul it on deck. Then we saw that its larger end was anchored at the bottom, while the smaller was shod with a steel point. It was then left, the smaller end to float with the tide ready to pierce the hull of any vessel which struck it. We did did not wonder at the captain's indignation. If he had known how they had planted the river, the city would have had a seven years' famine before he would have risked his steamer to bring its people supplies.

NEW YORK CITY.

OUR WASHINGTON LETTER.

BY KATE FOOTE.

THE week has seen the beginning of Lent, Washington's Birthday, which came in with a blizzard in the matter of flying snow by the airful and sunshine bright enough for May. Politically, we have had the House making a sort of struggle at an all-night session. Their object was to pass the Car Coupler bill. One cannot help sympathizing with the upholders of this bill when one understands its object fully. More than any other that has been brought before Congress this touches one's sympathy. Mr. O'Donnell, one of the members from Michigan—earnest, honest, able and gerrymandered out of his district by a Democratic Legislature so that we

shall not have him back next year—had his attention called to the number of lives lost among the men employed on the railroad in his native town, Jackson, which is quite a railroad center. He was standing on the platform one morning about to start for Washington, when a freight train backed up near him to take on extra cars, and one of the brakemen stepped forward to hook the coupling. He was a bright-eyed Irishman, with the quickness at a turn of thought and act peculiar to his race. He stepped between the cars, and the next second without warning and with a jerk the car pushed up against the one in front of it. Nothing saved the man from an awful accident but his phenomenal quickness of motion. With a glide that was snake-like in its dart he was out from his dangerous position and with a smile he turned to Mr. O'Donnell and said: "It's that time I saved meself; but it'll catch me yit. Jimmy Sheehan wint that way at last, an' him quicker than I be."

The incident struck Mr. O'Donnell very forcibly. It took the practical turn with him of a study of car couplers, their difference, and the dangers to which railway men are liable. Then the possibility of legislating to enforce the use of automatic couplers absorbed him and awoke others. Such things are in the air sometimes; and Mr. O'Donnell found others awake as well as himself. The consequences are that several bills have been offered in the House and in the Senate, aiming at a regulation of so small a seeming matter as the way our railway freight cars shall be fastened together. Senator Hawley made a speech in the Senate, not long ago, that attracted attention. He said that "the year 1891, 28,000 people, men, young, active and earning their living, were either killed or wounded upon the railways of the country, while engaged in their work upon the trains. From these injuries 2,660 died. Out of 26,140 wounded, 6,000 would also die, at least 5,000 is a fair average.

"I would as a part of this great Government imperatively command all railroad companies engaged in interstate traffic to do something in this line within two years. I do not know what, but I know they can do something. I know that the present insufferable, barbarous, stupid and murderous condition of things is not a necessity in the face of the illimitable ingenuity of American mechanics and American inventors. There are certain improvements, and if they amount to the saving of five or eight thousand lives or wounds a year, they are worth trying, and then next year do something better.

"I never knew the time when people, situated as the railroad companies are, and as other corporations are, were ready for remedial legislation of this description. I am not at all troubled about interfering with other people's business. This is the business of the whole country; it is the business of the thing called Government."

The last words were an allusion to the pathetic remonstrance of the railway owners who ask to be let alone in their work of carrying millions of people every year upon their roads, and who urge that this is not a paternal Government, and that Congress has no business to interfere.

Senator Chandler also made some pithy remarks; in one part of his speech he said:

"The railroad employés of the country want this system to be ended. They do not want any undue haste about it; they are entirely reasonable about it. This bill does not require any particular kind of coupler to be adopted by the railroads, except a coupler which can be coupled and uncoupled without requiring anybody to go between the cars. The coupler adopted by the railroads may be a clutch coupler, or it may be the old link-and-pin coupler made automatic.

"Whatever the railroads of this country choose to adopt, they are at liberty to adopt; but the bill is meant as notice to them—and that is about all the bill is—that they must not stand still, that they must go on in this direction, and that within a certain time, to be named in the act, which time can be extended as to any failure by any railroad company if the Interstate Commerce Commission choose to extend it, they shall afford that security to the limbs and the lives of the railroad men of this country, which I think, and which I believe every person who has investigated the subject thinks, should be furnished to them, if not by the railroads of the country, then by the Congress of the United States."

Mr. Chandler felt the argument urged by the railroad owners that they were "going to do something"; meantime they would like to have the Government not meddle with them.

The way to make a Government paternal is to neglect the public safety until public attention is called to it. Railway owners have it in their own hands, and can prevent the paternal idea from being ingrafted upon Government methods by adopting some general and safe car-coupler. But this, of course, they will not do until they are driven by the sharp point of such a bill, forcing them to prompt action.

The bill passed the Senate, and went down to the House, where it fell among friends—and some very warm enemies; these were the men whom the railway owners had enlisted on their side, by pleading that they were "going to do it," and that it was hard to be put to the expense of providing new couplers to the cars, at least until they had worn out those they already had. The enemies filibustered. The friends were not to be driven away by a trifle like that. Both sides sat it out. At two o'clock in the morning Mr. Bryan, of Nebraska, spoke in favor of the bill, and assured the opponents that he and the friends of the bill should remain loyal to the interests of the workingmen, and there they did stay until after daylight. And after that even Mr. O'Donnell had to give it up, and so the bill has not passed.

Washington's Birthday was celebrated by various parades, made at great disadvantage because of the raging wind that filled the air with powdery snow, swept from the neighboring housetops. Patriotism is a fine thing, but that day it reminded one of Valley Forge with this in favor of the valley, that Washington would not have paraded his men on such a day, even if they had overcoats. We were catching the outer edges of the great storm which had raged through New York and Pennsylvania—that is, the air part of it was very much alive; but the clouds had faded away, or been worn out in the more northern part of the country, so the sun was shining, without, however, having any effect upon the situation. That old fabled struggle between wind and sun for the traveler's cloak was acted over and over again on the streets with this difference, the sun failed to warm the traveler and so melt the cloak off him.

The Daughters of the Revolution commenced their second annual congress on the twenty-second, beginning with a large party the night before given by Mr. and Mrs. William D. Cabell at their residence, Norwood Institute, on Massachusetts Avenue. This was followed by other festivities—a large reception given them by the Sons of the Revolution in the new parlors of the Arlington, where General and Mrs. Greeley, with Justice and Mrs. Brown, Senator and Mrs. Dixon, Mr. and Mrs. Julius C. Burrows, Mrs. I. C. Breckenridge, and a long line of other ladies and gentlemen received them.

The Daughters, however, did not give themselves entirely to the pleasures of society. They held business meetings during the days of Wednesday, Thursday and Friday, elected their officers for the coming year, listened to several fine historical papers prepared by the different lady members. The interest of these papers lay largely in the new aspect of the War of the Revolution from a woman's point of view. They did not neglect to chronicle the acts of the men, but they put along with them what the women did, and thus made the picture complete. President Harrison and Mrs. McKee received the Congress of Daughters at the White House on the afternoon of Thursday, and all went with a tender memory of Mrs. Harrison, who had presided so kindly and so well a year ago. Her name had been remembered at the meeting by a chair on the platform, not draped with the black we have seen so much of, lately, in Washington, but with a wreath around the words "In Memoriam."

On the same evening with the reception of the Sons and Daughters of the Revolution at the Arlington occurred, also, the marriage of Miss Florence Miller, the daughter of Attorney-General and Mrs. Miller, to Mr. Clifford Arrick, of Baltimore.

Miss Miller is very pretty, with blond hair, like her mother, and she, with her father, headed the bridal procession down the stairs and through the parlors to the bay window, where the groom and his best man met them, with due grace and dignity. Her wedding gown was of ivory white moire with satin stripes, her veil was of tulle, and she carried a bunch of bridal roses. Miss Jessie Miller was the maid of honor in rose pink crape with a bouquet of La France roses in her hands. Dr. Bartlett, of the New York Avenue Church, met the bride and groom under the canopy of flowers and plants that lined the bay window of the front porch and read the ceremony of the Episcopal Church. Then a reception followed, after which the bride and groom went away for a short trip to come back for a visit before the return of Mr. and Mrs. Miller to Indianapolis early in March. Mr. Miller was the law partner of President Harrison and may continue the firm with him after the fourth of March. President Harrison was prevented from attending the marriage by the fact that he had to be in New York that day to attend the ceremony of hoisting our flag upon the steamship "New York" on the occasion of the change of that line of Atlantic steamers to American owners. It was considered of importance enough to warrant the appearance of the President at the ceremony and also that the day chosen should be the twenty-second of February.

Among the guests present at the Attorney-General's on the evening of the wedding, were Mrs. McKee, Mrs. Russell Harrison, Mrs. Dimmick and the Vice President and Mrs. Morton—the whole presidential family. For the ladies of the White House it was their first appearance in public since the death of Mrs. Harrison. Among the guests from out of town at the wedding were Judge and Mrs. C. C. Hines, of Indianapolis; Judge Taft, of Cincinnati, and Mrs. John Jay Knox, of New York.

There was also, upon the evening of the twenty-second of February, a reception given by Mr. Gardiner Hubbard to Mr. and Mrs. Dawes and Miss Dawes. It was a farewell party for Mr. Dawes who after thirty-six years of service, during eighteen of which he has been Senator from Massachusetts, declined a re-election. Most of the Senators were present and many of the Cabinet, and the Supreme Court, with Major and Miss Halford, Bishop Hurst and others who are residents of Washington. Mr. Dawes made his record as Chairman of the Senate Indian Committee. To him we owe the bill for allotting lands in severalty to the Indians; he never gave it up altho it required a struggle of seven years before the bill passed both Houses and became a law. Mr. Dawes has given Indian matters and legislation his chief attention, but he was also on the Committees for Appropriations for the Fisheries, for Civil Service and Retrenchment and upon two Select Committees, the Five Civilized Tribes of Indians and the Pacific Railroads. Those friends of the Indian who have owed much to his kindness in understanding their needs and his ability in bringing forward the best legislation for the Indians of this country, feel that he will be a great loss and look forward with grave apprehensions to the possibilities of trouble when the new Chairman of the Senate Indian Committee shall be appointed.

The Secretary of State, Mr. John W. Foster, left for London and Paris last week, to be present at the international arbitration on the Bering Sea question. With him were Mrs. Foster; Miss Cockrell, daughter of our Senator from Missouri; Miss Halford, daughter of the Private Secretary of the President; Miss Williams, daughter of Judge Williams; and Miss Shields, daughter of the Assistant Attorney-General. There were also Mr. Morgan, Senator from Alabama, one of the arbitrators, and Mr. Hubbard T. Smith and Mr. Francis Jones, attachés in different capacities to the Board of Arbitration. The young ladies of the party are to meet friends abroad or to be placed at school in Paris. Mr. Foster retired as Secretary of State, having filled the position since the resignation of Mr. Blaine, not quite a year ago. The Assistant Secretary, Mr. Wharton, will take his place. If we decide to annex Hawaii, the arrangements have been so well perfected that the Island Territory can come in without further assistance, and Mr. Foster may feel that he has made a pleasant termination of his career as Secretary. He did much of the work before Mr. Blaine resigned, because of the ill-heath that afflicted Mr. Blaine so much the last year or two of his life. It seemed a natural thing that the President should ask Mr. Foster to take the position, and he has filled it well. He has a feeling that office means work, and he carried this to the point that, busy as he was with the affairs of State, he went to the Washington Literary Society and presided even when he had to leave at the close of the literary exercises to meet some appointment elsewhere. He has had more experience in diplomacy in affairs between nations than any other member of the Arbitration Board. Mr. Morgan, Judge Edward J. Phelps, Justice Harlan—the names bring up to to one's mind visions of law and learning, but they have not had the long and varied practical experience of Mr. Foster in dealings between countries. Let us hope that the muddle which Mr. Cleveland made of international questions will not be repeated in his next Administration, and that the Bering Sea arbitrators will force England to acknowledge that she has no right to plunder the high seas, bagging stray islands, or seal herds on their way to an island upon which they emerge to become the factors of a great industry.

The day after the twenty-second of February, Washington still presented a snowy front, but the worst of the wind struggle was over. The next step was to thaw the snow and the ice, and that began promptly and went on fast. The ground hog may have changed his views about an early spring and the next two weeks be a forerunner of pleasant weather. But the ground hog appears to be an animal of a changeful nature and the weather bureau has no influence with him, politics has no prize to offer him, so all we can do is to take what weather comes while we assure strangers that we have a fine climate—very fine—but some weather—well, yes, some that is not quite in accordance with the climate.

The Birthday of Washington makes one think of the Father of his Country and his friends. I was shown yesterday a miniature painted on ivory of Lord Fairfax, the friend and in some sense the framer of character in our patriot. The picture, painted in 1768, is that of a handsome man, a little past the prime of life, judging from the shape of the chin, with dark eyes and eyebrows, good features, and a powdered wig in the fashion of the day. He wears a gown of black silk and bands, which is accounted for by the fact that he was a minister of the Established Church and often preached. The picture has come down through the female line, from his daughter, Lady Ann Fairfax, whose descendants are still living in Virginia and Maryland. The picture is well painted by some unknown artist, and is full of interest from its age and its association with our early history. It was shown me by an ardent lover of such things, who has also many interesting parchments and old books, Mr. W. F. Borgher, of Washington. Among these parchments is one of fine clear skin, one of the twelve Amendments to the Constitution that were sent to the thirteen States, and it has the signatures of John Quincy Adams and Frederick J. Muhlenberg, our first Speaker of the House. The Amendments are those which give the right of petition and the right to redress grievances by due course of law and they are so comprehensive that it makes one ask what could a people have done without them.

MISS SUSAN B. ANTHONY recently celebrated her seventy-third birthday at her home in Rochester.

Fine Arts.

CURRENT ART.

LIKE the ebb and flow of the tide come and go the various exhibitions throughout the city. We propose here to record the most vivid impressions which they leave upon the eye and mind. The present wave-crest is represented by the Loan Exhibition at the American Fine Arts Gallery—a rich and rare collection of old and new masters that should not be neglected by lovers of art. The "Academy Water Color" is about to close and give place to the spring oil exhibition—it was said that five hundred more blanks were sent in this year for the water color than last, which will, no doubt, be the history of the oil. This means that the small wall space accorded to outsiders after the N.A.'s and the A.N.A.'s have satisfactorily disposed themselves will be more largely competed for than ever, and that each "outsider" will have a slimmer chance. Unfortunately most of these exhibitions are close corporations, and tho fair enough in a general way, they conscientiously put their belief into practice that charity begins at home. All honor to the outsider who is well hung, and honor too to those who accord him his hanging.

The American Art Galleries, on Twenty-third Street, promise something interesting in the way of a preliminary exhibition of applied arts to facilitate the collection and selection of high-class art and industrial work by women for the World's Columbian Exposition. This will be something unique in the way of exhibition, embracing decorative painting, stained glass, plastic ornaments, designs of all kinds, modern textiles and tapestries, lace and illustration, under the directorship of Mrs. Candace Wheeler.

The last Loan Collection of the Union League Club was noteworthy for being a uniformly good one. These exhibitions occur monthly, and on "Ladies Day" fur and feathers, flounces and furbelows are packed like herrings, and as one is inserted in the crowd, in that relation one remains, only being swayed by the general pressure before one picture after another until the circuit of the room has been made. The only gentlemen present are those of the reception committee. They remind one of buoys on the heaving breast of an ocean. Gray-headed boys, after all, most of them, but none the less gallant. Cazin had a number of good things there, notably "The Misty Moon," which showed a real feeling for nature. Mr. Charles C. Curran's "Woman and Chrysanthemums" was atmospheric and delicate, lacking his usual hardness of treatment. The left hand resting on the mouth of the jar of flowers was charming. Elliott Dangerfield showed several canvases, quietly dignified and full of a solemn sentiment. This artist has been accused of imitating Millet; but whoever studies the serious side of peasant life (Mr. Dangerfield paints the natives of our North Carolina hills) must follow in the footsteps of Millet, and surely there are no better footsteps to follow. Mr. Kenyon Cox seems to follow Puvis de Chavannes, and he in his turn drew inspiration no doubt from Lorenzo di Credi, tho he misses the quaint interest and sentiment of this artist of the Tuscan school, an example of which may be seen at the present Loan Exhibition at the Fine Art Society, Fifty-seventh Street. Gérôme's "Bonaparte in Egypt" was at the Union League. One almost wants Napoleon left out; he is painted like a miniature and seems inappropriate with the Sphinx. The exclamations were generally "How smooth it is!" I do not know if this was intended for admiration, but, as the crowd was fashionable rather than artistic, it presumably was. There was a mystic moonrise by Lerolle, with a weary figure in the foreground wondering if he would ever reach the beacon light from the far cottage door. Madrazo, Rico, Rousseau, were all there. Smillie was shown to better advantage than generally, his landscape really looking as if he had painted it from nature. Mr. William Thorne's "*Tête-à-Tête*" attracted much attention; the quiet figures against a thinly curtained background through which daylight fell softly, the girl's white drapery, the interesting expression of the man's back, were certainly effective. Mr. Whittemore came out vigorously in a sparkling summer landscape, and the head of a child with the figure of a woman, nevertheless full of light and solid in construction. One of Cazin's moonlights was exquisite; but one of the most charming moonlight effects is Stevens's little figure standing on a balcony under the stars—solid, exquisite, dainty; her clothes too are not strikingly unfashionable! Such life in water and smoke and moon that it remains upon the eye as a reality—this is at the American Fine Arts Gallery.

There, too, one should go for portraiture and to study Romney, with his lovely gray tones; Constable, so mellow and free; our own Gilbert Stuart, so simple and fresh and unconscious. Take a look at Mrs. Bingamen, No. 30, in the first room; drink her in, it will be a sweet, refreshing draught, with no affectation of technic, line or pastel movement, iridescent mother of pearl, embroidery or the rest; it looks as if he had done it without trying both as regards drawing and color. It makes you feel how little it takes to make a portrait, and not how much. Sir Joshua Reynolds's "Portrait of a Lady," No. 53, is simple and dignified and mellow, almost without color. Teniers, with his easy detail and Frans Hal's small portrait head of "Scrivenius," painted somewhat in pastel movement, and in an intensely high key—compare these with a Weir of 1893—he was not ever thus with his polychromatic rage. Monet belongs to that school; but in his intense moods he is full of nature's beauties, tho at hours of the day when the world is scarce awake. Mr. Carleton Wiggins paints good cows; but a simply lovely cow is the "Red and White" one by Mauve in the Loan Exhibition.

Another exhibition just opened is that of the Woman's Art Club, at Lanthier's Gallery, 22 East Sixteenth St. The work is exclusively that of members, with the exception of a few canvases by strong women painters abroad. The palm is taken by Miss A. L. Gregory, "A Quiet Corner" in which sentiment, tone and technic harmonize in a complete whole. Miss Katharine Kinsella exhibits for the first time in this country two admirable landscapes, full of light and atmosphere. Miss Kate Greatorex is always vigorous in her large flower pieces, and the two here shown are no exception. Miss Gill has a large portrait, shown before at the "American Artists," which, tho a difficult subject, is full of faults. Miss Hawley sends Dutch scenes from abroad. Miss Hecker handles, like Thayer, a portrait of a child in iridescent tones. Ellen J. Stone is also strongly under the influence of this master, as shown in her clever dancing child. Miss K. M. Huger has on the line two interesting studio interiors in pastel, easily handled, and showing her rare feeling for color. Miss Reid has an original treatment of a storm. Few of the artists make an effort to combine figures which always multiplies difficulties, so one mentions with pleasure a sincere bit of work by Miss Edith Mitchell, workmen at rest with a sunlight background. Mrs. Parrish shows the charming little decorative figure exhibited at the Water Color Club, entitled "The Student." Mrs. Louise King Cox, displays the portrait of a startled young woman, nine heads high, and that with no crown to her head—her arms also are lumpy. Miss Cecilia Beaux has a life-sized good easy portrait of an elderly gentleman with charm of tone throughout; her foreshortened boy is also good and strong. Miss Annita C. Ashley, President of the Club, has a clever impressionist potrait painting in pastel done with great spirit and dash. Miss Ella Condie Lamb shows three good portraits. Madame Mesdag shows the touch of an experienced artist in her six canvases; her plums are delicious! Frances H. Throop has a good study in pastel. Miss Matilda Brown's cows are always good. Miss Slade is studying outdoor effects to good purpose. Madame Marie Cazin, the wife of the great artist, is represented by a "Moonlight" which shows a large sympathyof feeling for her husband's work.

Another exhibition that should not be overlooked, now being held at Keppel's, 18 East 16th Street, is of works by Evart Van Muyden. Van Muyden's nationality is a somewhat complicated matter. Born near Rome of Swiss parentage, he is legally a citizen of Geneva; in appearance he is quite Italian, while both Christian name and surname are pure Holland Dutch; yet he resides in Paris and speaks French like a Parisian. Notwithstanding this rather intricate extraction there is nothing indefinite or scattered in his art. Altho his portrait, etched by himself, shows his power in that direction, he has devoted himself definitely to the career of "*Un Animalier*," as he calls himself, and among the animals his preference is for "the savage wild carnivora."

Both his etchings and pencil drawings are free, bold and delicate; one is reminded in turn of Barye, Bonheur, Gérôme, Détaille, Meissonier—and yet the artist is himself, and well worth looking at. The etchings are offered at low prices, and the public will do well to avail themselves of the opportunity.

At one of these exhibitions seeing a lovely child looking with intense interest at some of Mr. Dewing's dainty portraits—she was a red-haired little maiden in leather leggings and russet tones brightening here and there into soft yellows in the lining of her cloak and the kerchief about her neck, while a glimpse of heliotrope displayed itself where the cloak fell apart and showed a soft French apron from neck to skirt—my attention was transferred from pictures to child. What a lovely portrait she would make! When I could contain myself no longer I made bold to address the lady with her, evidently the mother, and with repressed enthusiasm I exclaimed: "Madame, excuse me; but has your little girl ever been painted?" "Not for years," she replied. "Can I not then urge you to have her done by Thayer or Dewing; she has a face that Dewing would love to paint!" With a quiet smile she said: "You know who she is, do you not?" "No, I do not." "She is Mr. Dewing's little daughter, and I am his wife."

Sanitary.

PNEUMONIA AMONG BUSINESS MEN.

DR I. F. ALLEYNE ADAMS read a paper on the Prevention of Disease before the Massachusetts Medical Society last summer, which embodied the results of an exhaustive study of the vital statistics of disease in that State for the last twenty years—a period during which they have been recorded with an accuracy previously unheard of. He finds that since the Board of Health got to work in 1870 smallpox, scarlet fever, measles, typhoid fever and consumption have diminished; but this pleasing discovery is accompanied by another which is discouraging to the sanitary reformers and sanguine physicians who have thought they were already witnessing the dawn of a better day; for with this large diminution of the plainly preventible diseases the death rate of the State remains stationary. Why?

The answer is not so very far to seek. Many of the young and robust sons of the State have betaken themselves to the wider and more enticing fields of action in the West and South, leaving behind the older and feebler contingent who are more liable to the diseases found to be increasing—viz., bronchitis and pneumonia; but the great thing that "levels down" is the increase in manufacturing with its large influx of ignorant operatives, many of them French Canadians, who, in their ideas of personal cleanliness and of preventive sanitation, are but a degree above the brutes, and who still are dominated by notions worthy of the Middle Ages. They would resist vaccination as an unwarrantable interference with the just judgments of God—if they could—but find that they must submit or be shut out from the mills. During an epidemic of diphtheria in Lawrence, Mass., a mother was warned not to allow her child to play with others who were known to have a case of diphtheria in their home. Her answer was: "It makes no difference; if my children are sick, it is the will of God."

But when all allowances are made for these, there looms up one mighty and discouraging fact, in the great and truly alarming increase of pneumonia—and that in educated, active business classes. The most fatal time is the first year of life—and then the great increase comes after forty, and the increase grows greater with each succeeding ten years.

Is there any widely operating cause that can be justly reckoned contributory to this result? Without attempting to dogmatize in what may be called an unexplored field, it is pertinent to ask whether *the great increase of steam heated office buildings in which the great majority of rooms have no adequate means for renewal of the air to be warmed* may not in a large measure account for it? Many of these buildings are admirably constructed to keep out air, whether cold or hot, and this very perfection contributes to their insalubrity. Up to the present time, there seems to have been found no efficient means of that renewal, save a chimney communicating with the outer air—an expensive duct, but vitally important. That the air in rooms which lack this becomes "oppressive," is witnessed by the various attempts to remedy the difficulty by patent, so-called, ventilators. Who hasn't seen the little whirling wheel inserted in a huge plate-glass window? A current is certainly created, else it wouldn't whirl; but it is like asking a fly to get up a breeze with his wings that will sail a yacht, to expect that tiny local agitation, to renew the large cubic quantity of air that goes to the renewal of the blood of the large "crowd" of office people who work in some of these rooms, placed as near as possible to each other, and still have elbow room.

When the Waterlow-Allen Improved Dwellings in London were built, a set of thorough sanitary as well as financial statistics was initiated in connection with them; and, after a few years, it was found that the death-rate in these was as low as in the best parts of rural England, and that, too, when the controlling element in the choice of site had been simply to bring the laborer near to his work. How was this rate, much smaller than that of the fashionable quarters of the town, to be accounted for? *The* one differentiating circumstance was that every room had a direct communication with a chimney. Some of the "apartments" consisted of only two rooms and a scullery; but no matter, each living room has its grate stove; and when the fire has done its office in cooking, the Englishwoman—who reckons her coals as true, black diamonds—lets down the wasting blower, and saves them by transforming the stove into an open grate, and there is a permanent open grate in every sleeping room.

In these hermetically sealed office rooms that abound in our business buildings, the steam heats the atmosphere to a delightfully comfortable degree; the occupant breathes and rebreathes the air in the zero days, when he cannot endure an opened window; and the effect is to silently undermine his powers of resistance, so that when he goes forth, exchanging this balmy tropic air for the keen breeze, off a frozen harbor, it may be—through some subtle change in his system which has robbed his lungs of their power of resistance—their ability to endure the onset is gone, and in a few days his death "of pneumonia" is recorded. The age when this great increase occurs, "after forty," is significant. Before that as "junior," or clerk, or office boy, the younger man often emerges into the outer air, and gets his blood healthfully oxygenated; and, of course, the older the man the more closely he "sticks to his desk," till the subtle poison of unrenewed air does its deadly work, and he ceases to be at his desk altogether. The subtle, invisible element that works this demoralizing change in the tissues of the body, is not the carbonic acid gas that we were once taught killed us, it is the tiny modicum of dead animal matter that leaves the lungs along with the mephitic gas; and just now New York is having an object lesson of what a poison it can generate, for "typhus" is its highest degree of achievement. Dr. Edson confidently says: "When the season of open windows comes it will disappear." But how many intermediate degrees may there not be? While the tramp smothers in the crowded room of "Happy Jack's five-cent hammock house," the millionaire, if not a wary and enlightened one, takes in his all-sufficient portion of vitiated air in a room with an onyx dado, but destitute of that first essential of life, a breathing tube.

What is the remedy?

Adequate chimneys.

But think of the enormous cost! Yes, but "all that a man hath will he give for his life," and perhaps we may yet attain to a new commandment, "Thou shalt not kill, either by the detonating pistol-shot or the silent blood-poisoning of unrenewed air."

Science.

AT the International Congress of Archeology, at Moscow, in 1892, Mr. S. Nikitin, Director of the Geological Survey of Russia, read an important paper upon "The Quaternary Deposits of Russia and their Relations to Prehistoric Man," which has recently been published in French. It is of special interest at the present time to note that this high authority in glacial matters does not admit the necessity of supposing that there were two glacial epochs, but, on the contrary, maintains that all the facts which appear in Russia can easily be explained by a single continued glaciation, and by a single glacier whose front was subject to oscillation. Referring to the "so-called interglacial deposits of Germany, England and Scandinavia," and to "the idea of two epochs of glaciation" (and even of several according to some investigators), he remarks (we translate):

> The theory is far from being irrefutable. . . . The supposition of three and even four distinct glaciations, instead of two, indicates the possibility of diverse explanation and diverse opinions upon the genesis of these interglacial deposits; while recently for several countries the weakness of the proofs which have been used in affirming the existence of several glacial epochs separated by periods whose climatic conditions have been entirely different has recently been demonstrated. Contemporary geological literature furnishes us with some examples which demonstrate that there has been an error in interpretation even in the case of certain classical exposures of interglacial deposits,

so that these have now lost the importance which was formerly accorded to them.

As described by Nikitin, the glacial phenomena in Europe seem to raise very much the same questions which are now so warmly discussed in America—namely, whether the moraines which have been ascribed to a second epoch in Northern Germany (and which fall far short of extending to the limit of glaciation), necessarily indicate that the ice had receded nearly to its present limits before its re-advance to the moraine line indicated. In this country Dana, Hitchcock, Cook, Wright, Warren Upham and others have held that these moraines, attributed by Professor Chamberlin to a second glacial epoch, are more properly moraines of recession, of which a dozen or more are to be found in Ohio and further west, marking temporary stages of retreat during the history of a single continuous epoch. This same view is also held by some of the best authorities of Europe, including Credner, of Germany, and Holst, of Sweden, and, as it would seem, is maintained by Nikitin in the light of his extensive investigations upon the subject. The remains of man in Russia which can be connected with the glacial period are very similar in their situation and in their association with the remains of extinct animals to those which have been found in Western Europe and in America. These consist of flaked flint implements associated with bones of the mammoth and other large animals in the high-level river terraces and in lake deposits which were formed while Scandinavia and Finland were still covered with glacial ice. Before the ice had withdrawn from these most northern areas, allowing man to penetrate them, the mammoth, the rhinoceros and other gigantic animals with which he had been associated had become extinct, at least in Russia, and man had passed from the paleolithic stage, in which he used only flaked flints, to the stage in which he used also polished stones and pottery. Dr. Nikitin's investigations fully confirm the division of prehistoric times into paleolithic and neolithic epochs which has so generally been recognized in Western Europe, and which is maintained by most authorities in America.

....In his remarkable book, "Experimental Evolution," Dr. De Varigny, of Paris, pleads for the foundation of an experimental institution, where laboratory and field experiments on the causes of variation could be carried on. Such an institution would possess extensive grounds, a farm with men experienced in breeding, in agriculture and horticulture, some greenhouses, and a laboratory with the ordinary chemical and physiological appliances. The experiments once begun should be pursued during many years; even if some of the experimenters should die, the work should be taken up by others, as such experiments might exceed one or several persons' lifetime. There is great need of such experiments as those which have and are being carried on by Dr. De Varigny in Paris, by Mr. Poulton in Oxford; such as have been made by Semper at Würtzburg in Germany, and by others. It is strange that some ingenious, patient American student of evolution does not enter on such work. Our agricultural experiment stations would already afford excellent working facilities.

....In the "Proceedings of the Academy of Natural Sciences of Philadelphia," are numerous biological notes on wild plants of our country, many of which have some popular interest. There is one which has reference to the common "Eyebright" (*Euphrasia officinalis*), in connection with the modern speculation that flowers have become modified in time in order to secure cross-fertilization In the case of this plant it would appear that after securing adaptation to cross-fertilization it tired of that condition, and has returned to its original habit of self-fertilization. That is to say that if the prevalent speculations are correct, this has been the course pursued. As the plant is common in damp places along the coast northwardly, those curious in such matters can examine the flowers for themselves.

....The museum at Leyden contains a huge and almost perfect Æpiornis egg, bought from a Frenchman for a thousand guilders, or about $400, something less than a third of the price paid not long since for the egg of the great auk sold at auction at Stevens's rooms in London.

School and College.

ITALY has some serious difficulties in her higher institutions of learning to contend with, but a vigorous movement toward reform all along the line has been inaugurated. Even to a greater extent than is the case in Germany, Greece or Denmark, there is an overcrowding of the universities in Italy and the consequent troubles of a "learned proletariat." Germany, with less than fifty million inhabitants, has about 27,600 university students, or one for every 1,860 of the population. Italy, with a little more than thirty millions, has 18,618 students, or one for every 1,757. Then there are entirely too many universities in the country, namely, 21, exactly the same number that Germany has. Thus Italy has one university for every 1,450,000 inhabitants, Germany one for every 2,357,000. Full universities there are only 17 in Italy, to which are added the "free universities" of Perugia, Camerino, Ferrara, Urbino, which have all an exceedingly small attendance; the poorest in this respect being Urbino, which with a faculty of 23 had only 67 students. The Italian Parliament proposes to close the six State universities that have the smallest attendance—namely, Modena, Messina, Parma, Siena, Macerata, Sussari, the total attendance of which during the last year was only 1,515 students. Eleven universities will then be continued, and of these ten of the first rank—namely, Naples, Turin, Rome, Padua, Bologna, Palermo, Pavia, Geneva, Pisa, Catania. The largest is Naples, which last year had an attendance of 4,641. Catania, the smallest, had an enrollment of 616. To these, as an institution of the second rank, is to be added the Academy of Cagliari, with 164 students. The cities that are to lose their universities are already making determined protests, the loudest of all being Messina.

....The University of Pennsylvania is to have a building entirely devoted to chemistry. The new structure will stand just south of the laboratory of hygiene, on the northeast corner of Thirty-fourth and Spruce Streets, and will be built plainly and substantially of brick. There will be three floors and a basement. The plan is to divide the work into three parts, namely: General chemistry, analytic chemistry and organic chemistry, with original research, and to devote a floor to each of these departments. The basement will contain an assay room with twelve large furnaces of the best make. The first floor will be devoted to general chemistry, the second to analytic, and the third to organic chemistry. On each floor there will be besides the lecture room and laboratory, several small rooms for assistants, balances, or for special work.

....John Hopkins University celebrated its seventeenth anniversary February 22d. The trustees, faculty, invited guests (including the Governor of Maryland and Mayor of Baltimore) and students marched in procession from the university to the Peabody Institute Hall, where the exercises were held. An address was delivered by President Angell, of University of Michigan, on a subject pertaining to higher education. He was followed by President Gilman on medical education. The degree of Doctor of Philosophy was conferred on two candidates—Daniel A. Murray, associate professor of mathematics in the University of the City of New York, and Lieutenant George O. Squier, of the United States Army.

....According to the annual report of President Eliot, eight new professorships were created last year in Harvard—four in arts and sciences, two in medicine, one in law, and one in veterinary medicine. According to the report of the treasurer, there were gifts during the year of $516,000. The total expenditures for the year were nearly $1,000,000. The faculty of arts and sciences have announced that a new dormitory, to cost $150,000, the gift of an anonymous friend, is to be built at once, with special reference to the accommodation of students of small means. Another gift has been received, also anonymously, for a new library reading room. The room is to be large enough to seat comfortably 400 persons.

....The students of Wesleyan University at Middletown, Conn., have asked that a plan similar to that recently adopted at Princeton concerning examinations, be put into operation. They want the faculty to trust them, and they will bring pressure to bear to prevent cheating on the part of any of their number. The faculty favor the new plan. President Raymond announces that plans for the new gymnasium are so far advanced that the work of erecting the building will begin as soon as the frost leaves the ground. He also announces that a friend of the college had offered to remodel the whole interior of the north college, making it practically a new dormitory.

....The annual contest of the Colorado State Oratorical Association was held February 17th, at Trinity M. E. Church, Denver. Denver University, Colorado College (Colorado Springs), and the University of Colorado (Boulder), were represented. Mr. Frank W. Woods, of Colorado College, was awarded the first prize, and will represent the State at the interstate contest, to be held at Columbus, O. Colorado College furnished the State orator last year also.

....For the first time in many years there has been a decrease in the attendance at the University of Berlin. The number of matriculated students now is 4,878, which is 276 fewer than last term. All the departments have been affected by the loss except the Philosophical Faculty. In addition 2,895 students of other schools in Berlin have the privilege of attending lectures at the university, so that the entire number of hearers is 7,771.

....Trinity College, Hartford, has received $10,000 from the estate of H. G. Russell, for a Russell fellowship.

Personals.

QUEEN LILIUOK ALANI is not in pressing need of any annuity for her support, as she already has an income considerably larger than the salary of the President of the United States. She has always been thrifty and not at all like her brother, Kalakaua, who was notoriously a spendthrift and always in debt. When Princess she received from the Government $8,000 a year, and in addition owned property from which she derived about $4,000 a year. While Queen her income from crown lands was $60,000, and the Legislature appropriated $15,000 a year for her household expenses and $10,000 for her private purse, so that her total income for the two years that she was on the throne was $180,000. It is said that she is not, as has been stated, a member of the native Church, and is a very superstitious woman, frequently consulting the soothsayers or Kahunas.

....The story is told of the late Justice Lamar, that at one time when a guest of Judge Wharton, of Jackson, Miss., a woman on crutches, evidently of extreme old age, came and demanded access to "Cousin Lucius." The Senator granted an interview and afterward acknowledged to his host, who courteously absented himself, that she was a relative. On being asked how he knew, he replied: "How do I know it? I see the the family pride sticking out all over her. She is as poor as Job's blue turkey, but she scorns any assistance whatever; that is a family failing, Judge—a family failing, sir, of which I am as proud as my kinswoman."

....It is announced that Lowell's late home in Cambridge is to be preserved as a permanent memorial of the poet. The house, which is in a beautiful situation, is one of the best specimens of the colonial architecture in that locality, and thus is of historic importance. Most of the interior furnishings are kept as Mr. Lowell left them, especially his books. The city of Cambridge is considering the matter of a comprehensive system of parks, and it has been proposed that it should give a liberal sum toward the purchase of this property.

....The story is told of "Chris" Magee, of Pennsylvania, that when a barefoot boy in Pittsburg, he used to play frequently on a beautiful estate. One day the man who owned it drove him off, and he made a vow that some day or other he would own that property. At last he became successful, and when the estate was for sale he bought it. He kept the old front of the house with its beautiful lawn just as he had played on it as a boy, but he built in the rear one of the loveliest homes in the world.

....It is a custom of Queen Victoria on the occasion of a wedding of a relative or royal friend always to present an India shawl as a wedding gift. Accordingly among the presents received by the Princess Marie, of Edinburgh, on her recent marriage to the Crown Prince of Rûmania, was an elegant India shawl. A magnificent diamond diadem, however, accompanied it.

....It is reported that Mrs. Cleveland is to make an innovation in the White House by having a private secretary. This lady, a Mrs. Tuomey, has traveled a great deal, and is acquainted with several languages. She will attend to the voluminous correspondence of the social side of the White House.

....A Miss Thorndyke, of Boston, who married Señor Buenolos, a Spanish noble and now Spanish Ambassador at Berlin, has received recently royal honors in that city because her husband is supposed to represent his sovereign personally.

....Gen. Wade Hampton, altho seventy-five years of age, is frequently seen in Washington riding a spirited horse. He is in fine health, and there is talk of him as Commissioner of Railroads in the new Administration.

....At one time the Panama Canal Company sought to secure General Grant as its President, and offered him a salary of $28,000. He, however, declined because he thought the scheme impracticable.

Music.

BY E. IRENÆUS STEVENSON.

A GOOD deal of the most unlovely weather for seeking entertainment outside of any dry dwelling-house's four walls made no visible diminution last week in the audiences at several musical occurrences of strong attractiveness. This winter tests New York's esteem for music in a particularly practical, not to say locomotive way. There is just now more than an alliterative correspondence between Beethoven and a blizzard, Dvorak and a deluge, and symphonies and slush. And it is also pleasant to notice that practical interest is seldom misdirected, extending itself most undismayed by the elements to what is best. An ecclesiastical concert in celebration of the Papal Jubilee, on Monday evening, the three Wagner-music concerts and pianoforte recitals by Mr. Arthur Friedheim and Mr. Paderefski were prominent matters.

The trio of Wagner concerts, one on each of three days, in the Music Hall, became more than relatively things of interest, and their merit was appreciated by large audiences. The practical object of them, aid to the treasury of the Orthopædic Hospital and Dispensary, was a useful charity as well as a distinctly modish one, and must have been satisfactorily accomplished. The three programs prepared were liberal of extracts long ago familiar to the public here and now possessing an interest peculiarly retrospective if not chiefly such. But they were welcome. So considerable a number of capable and well-known singers came together in the performances as to lend to the incident something of the honors of a small Wagner Festival. The artists taking part included Mrs. Clementine de Vere-Sapio, Miss Lillian Blauvelt, Mrs. Martha Burckhard (a newcomer here and a superior artist in every way), Mrs. Lena Luckstone-Meyers, Miss Charlotte Maconda, Mrs. J. Middecke-Mertens, Mrs. Clara Poole-King, Miss Katherine Fleming, Mr. Agostino Montegriffo, Mr. William H. Rieger, Mr. Charles H. Clarke and Mr. Plunket Greene, Mr. Antonio Galassi. The chorus was a large and efficient one, and the orchestra that of the Symphony Society. The selections began with those from "Tannhäuser," and thence passing through the Nibelungen Cyclus they ended with a group from "Parsifal" and "The Mastersingers." The last concert on Saturday night, when the "Parsifal" music was given, was especially an artistic success, and the audience the largest and most brilliant from the standpoint of social representation of any at an evening musical affair this season. Mr. Walter Damrosch directed the performances: and by his careful conducting, by the earnest work of the soloists and chorus and the exceptionally strong orchestral playing of a band that has lately made surprising advances in the beauty and dignity of its work the three concerts began and were ended at a gratifying plane of merit and amid a great deal of deserved applause for every one concerned. It is plain that Wagner has suffered no detriment in the affections of his strong following in this city, by interruption to the stage performances to his masterworks.

The brief halt in Mr. Paderefski's playing in public, which so unesthetic a cause as an offending finger brought lately to pass, was more than forgotten in the fulfillment, on Saturday afternoon, of his postponed fourth recital—altogether one in which the pianist seemed to be in his best form and to play unsurpassably delightfully, tho with little or no use of the refractory digit in question. The program is appended. Mr. Paderefski lengthened the bill with his usual—and quite unnecessary—courtesy in the fashion that his audiences in town can no longer be blamed for expecting.

The fifth recital is set for the afternoon of Saturday, the program not yet furnished the press. By the by, this is a custom with the player which can be appreciated as not without benefit to him, but that has inconveniences to the large contingent of his hearers who are such from other reasons than mere curiosity or entertainment.

Fantasia and Fugue	Bach-Liszt
Sonata, op. 111	Beethoven
Papillons, op. 2	Schumann
Nocturne, Etude, Berceuse, Polonaise	Chopin
Melody, op. 8	Paderefski
Spring-Dawn: Mazurka-caprice	Wm. Mason
Hungarian Rhapsody, No. 12	Liszt

The plans looking more and more definitely to the return of a regular and official opera-season to this country, after the untimely veto thereto last year, came to a formal status as the week ended; one that the public will approve and regard as a topic of congratulation. The syndicate for which the Opera House property was bought in at its foreclosure a fortnight ago, has now merged itself in the anticipated new organization, to be known as "The Metropolitan Opera House and Real Estate Company." It assumes control of the injured theatrical building and of the apartment houses that are part of the block. The members of this company are thirty-four gentlemen, including the Messrs. John Jacob Astor, Samuel D. Babcock, Heber R. Bishop, George F. Baker, Charles F. Burney, George S. Bowdoin, Edward Cooper, Henry Clews, W. Bayard Cutting, H. C. Fahnestock, Elbridge T. Gerry, Ogden Goelet, Robert Goelet, George G. Haven, Thomas W. Hitchcock, Adrian Iselin, A. J. Juilliard, Luther Kountze, D. O. Mills, J. Pierpont Morgan, W. D. Sloane, H. M. Twombly, Cornelius Vanderbilt, W. K. Vanderbilt, A. T. Van Ness, William C. Whitney, R. T. Wilson, W. Seward Webb, and George Peabody Wetmore. From these has been selected a Board of Directors, including in it the Messrs. Babcock, Baker, Bowdoin, Robert Goelet, Haven, Juilliard, Iselin, Kountze, Mills, Morgan, W. K. Vanderbilt, Wetmore and Whitney. The formal incorporation, to occur at once, is expected to be followed by the election of the officers of the new company, which will make Mr. which Haven its president, Mr. Iselin the vice president, Mr. Bowdoin, secretary, and Mr. Hugh McClaren the treaturer. A general advisory committee will also be chosen. The foregoing stockholders will subscribe each for fifty shares of stock at six hundred dollars per share; and even the large aggregate of these subscriptions not being enough to rebuild the Opera House and carry out the plans for its usefulness on the lines proposed there will be a suitable adjustment of that difficulty by the issue of bonds to the amount of the shortage. The capital of the company is fixed at two millions of dollars. The thirty-four stockholders will be allotted each his box in the house on March 20th. The remainder of the boxes will be rented from season to season to the several outside subscribers in the usual mode. The Messrs. Abbey and Grau are expected to assume the management of the opera company to be secured for the season of 1893-'94. The work of rebuilding begins at once.

On Friday afternoon and Saturday evening of this week occur the rehearsal and concert of the Philharmonic Society—the fifth in the season's six. The program will be Schumann's "Overture, Scherzo and Finale" (or "Symphony without a Slow Movement," as it may be called); Lassen's Violin Concerto in D major, op. 87—its first American hearing; and Templeton Strong's "Sintram" Symphony, also a novelty. Mr. Plunket Greene and Mr. Henri Marteau give a matinée concert of ballads and violin playing on Saturday afternoon, and on the same afternoon occurs Mr. Paderefski's fifth pianoforte recital. There will be produced on Monday evening at the Casino "The Basoche," a three-act opera company, highly successful abroad, the score by Messager, who has written some charming music. On Thursday afternoon will be repeated, at the Music Hall, the Wagnerian program given at the second of the concerts for the Orthopædic Hospital—the selections from the Nibelung Tetralogy, with the same solo artists and Mr. Damrosch and orchestra. On Tuesday afternoon Mr. Arthur Friedheim will give his second pianoforte concert, in the Madison Square Garden Concert Hall.

News of the Week.

DOMESTIC.

WASHINGTON'S birthday was celebrated as a general holiday throughout the country. There were numerous meetings of societies, but special interest centered about the raising of the American flag over the "City of New York," in New York Harbor. The weather was very disagreeable, being a mixture of fog, sleet and snow, so that a considerable part of the program was omitted. The steamer was removed from her dock and anchored between the Battery and Governor's Island about 10:30 A.M. The Naval Reserve acted as guards and patrolmen. About 500 guests, including ex-Senator Warner Miller, ex-Mayor Grant, Mayor Gilroy, J. S. T. Stranahan, Collector Hendricks, Governor Werts and a number of prominent citizens went on board at noon. A railroad accident delayed the trains that were bringing President Harrison and his party from Washington and a number of prominent people from Philadelphia, so that it was after 2 P. M. before they reached the ship. A company on the way from Bath, Me., representing the shipping interests there, were also delayed by the storm in Connecticut, and sent their congratulations and regrets by telegraph. The ceremonies were commenced by W. Bourke Cockran who, in a short, appropriate address, introduced President Harrison. The President then said:

"*Mr. Cockran and Gentlemen:* It gives me pleasure to consummate here to-day, by the act of lifting this flag, legislation to which I gave my hearty support. I have felt as a citizen and as President the mortification which every American must feel who examines into the standing of the United States in the merchant marine of the world. I believed that we had reached an epoch in our development where the great work of internal developments was so far consummated that we might successfully take up the work of recovering our fair share in the carrying trade of the world. We lift the flag to-day over one ship—a magnificent specimen of naval architecture, one of the best afloat on any sea. That event is interesting in itself, but its interest to me is in the fact that this ship is the type and the precursor of many others that are to float this flag. I deem it an entirely appropriate function that the President of the United States should lift the American flag."

Immediately the flag arose amid the shouts of people on shore and the firing of cannon from the "Chicago" and Governor's Island. After the flag raising, luncheon was served in the drawing room of the ship, and soon after the President and his party returned to Washington. A trip down the bay had been planned for, but was given up on account of the bad weather. The "New York," as the ship is now called, is registered at Philadelphia, where 90 per cent. of the stock of the American line is owned. The names of all the ships of the line have been changed by dropping the words "City of" so that they are named New York, Paris, Chester and Berlin.

....On February 20th, in the New Jersey Legislature at Trenton, Mr. Parker, of Monmouth, introduced three bills regulating the race tracks and legalizing pool selling. After a sharp and bitter discussion, a motion to grant a public hearing was defeated by a vote of 32 to 21. The House then continued in session for five hours, carrying the bills through the first, second and third readings. One bill gives governing boards power to license race courses, another legalizes book-making, and the third repeals the disorderly house clause of the Sunday Liquor Selling Act. The three bills were passed by the House on the 21st, and by the Senate on the 22d. Governor Werts interposed his veto on the 23d, but on the 24th the bills were passed over the veto. Three Republicans voted in favor of the bills, and seven Democrats against them. The news was received with an outburst of indignation throughout the State. A large number of preachers made special reference to it in the Sunday services, and numerous protests were sent to the Governor and Legislature.

....Secretary of State John W. Foster presented his resignation on February 21st, in order that he may enter upon his duties as agent of the United States before the tribunal of arbitration on the Bering Sea question. On February 25th he sailed from New York in company with Senator Morgan, one of the arbitrators, and several of the attachés of the State Department detailed for duty in connection with the tribunal. Assistant Secretary Wharton will take his place during the brief time remaining until the fourth of March.

....Governor Osborn, of Wyoming, has appointed A. C. Beckwith, of Evanston, a Democrat, and the wealthiest man in the State, a United States Senator for the next two years. The appointment was occasioned by the adjournment of the Legislature without securing an election. The nomination has been received with considerable bitterness in the State, as the Republican candidate, John C. Thompson, only failed of his election by a single vote.

....The Director of the Mint at Washington has made his annual report, in which he says that the total value of the gold product of the mines in the United States for the past year was approximately $33,000,000, about the same as in other years. The silver product was 58,0001000 ounces, of $50,750,000 commercial value, and $74,989,900, coinage value. This is about 330 ounces less than the output of the previous year.

...In view of the fact that on February 13th the Governor-General of Canada issued an order revoking the discriminating tolls on food products through the Welland Canal for the season of 1893, President Harrison, on February 22d, issued a proclamation revoking the tolls of twenty cents per ton levied on Canadian vessels and cargoes in the Sault Ste. Marie Canal.

....The Hawaiian Treaty still awaits ratification. It appears that the friends of the ex-Queen have given up all idea of formal protest. The commissioners, who were expecting to leave during the week, delayed their departure in the hope of carrying the news of ratification with them.

FOREIGN.

....L. H. Davies, ex-Premier of Prince Edward Island, brought a very severe arraignment against the Canadian Government on February 23d, charging it with falsification of the record of the delegates' trip to Washington in search of reciprocity. Mr. Davies read the whole report on the subject made by Mr. Blaine to Congress, which proved the Government to be guilty of deceit, falsehood and political trickery of the worst kind. It showed that the Dominion Government would give its consent to no treaty embracing other articles than the natural products, a condition which every Canadian knew the United States would never accede to. As to uniform tariff, Mr. Davies thought it was a pure fabrication, and defied Mr. Foster to contradict him. The Minister did not take up the challenge.

....The Government accountant appointed to examine the accounts of the Panama Canal Company has made his report, stating that the total amount received by contractors for real or alleged work on the supplies for the Canal was 462,630,064 francs. Of this amount 102,358,44 francs represented labor. The absence of vouchers, however, made it impossible to be positive. The American Dredging Company's charges were over 69,000,000 francs, and another American firm claimed an account of over 16,000,000 francs. M. Eiffel's charges for operations and plants amounted to 73,000,000 francs, on which the net profit was 33,000,000 francs. The total traceable profits of the contractors were estimated at 77,747,504 francs.

....The referendum instituted by the Liberal societies in Belgium, to learn the sentiment of the people on the suffrage question, was taken on February 26th. There are 49 polling stations in Brussels, and each outlying village had one so that as large a vote as possible might be secured. The greatest enthusiasm prevailed throughout the city, despite the rain, and there was no disorder. In Brussels, about 25,000 votes were cast, a large majority favoring universal suffrage. In the city and suburbs together, 48,660 voted for universal suffrage; 7,689 for suffrage for men of more than twenty-five years; 3,935 for less radical plans. Over 50,000 men abstained from voting.

....In Parliament, Mr. Asquith, the Home Secretary, has introduced a bill suspending the creation of new interests in churches in Wales. This is the first practical step in the direction of disendowing and disestablishing the Church in Wales. In presenting it he claimed that the question was in the main a Welsh one; that the membership of the Established Church included hardly one-fourth of the population. Orangemen have issued a manifesto bitterly opposing the Home Rule bill, and reports from the North of Ireland indicate that there will be forcible resistance to a Home Rule Parliament should it be established.

....In France M. Le Royer resigned the Presidency of the Senate, giving failing health as the reason. M. Jules Ferry was elected his successor by a majority of 146 votes. It is understood that this election gives special satisfaction to President Carnot, and it is expected that his inaugural address will be conciliatory and cautious. The opposing candidates were M. Magnin, who received 53 votes and Jules Simon who received two votes.

....Reports come from Congo Free State that a horde of Arab slave traders, commanded by a son of Tippoo Tib, have been defeated and that 500 prisoners and 600 rifles have been captured on the Lomanni River. Eighty slaves have been freed. It is said that the Arabs are constantly securing the best of arms, and that unless cannon can be sent at once, the Europeans cannot hold their own.

....Ex-Premier Crispi has made a severe onslaught on Premier Giolitti in connection with the bank scandals, and together with ex-Premier Rudini called for an investigation. Their motion, however, was rejected by the Italian Chamber of Deputies.

....There have been reports of great excitement in Santo Domingo on account of the concession of the customs, together with an accompanying grant of land, to an American syndicate.

....The Bering Sea Commission of Arbitrators held a formal meeting in Paris on February 23d, but adjourned until March 23d. A number of the arbitrators were not present.

....The cotton spinners at Oldham having accepted a reduction of two and a half per cent. in wages, about 250,000 spindles have been started.

....It is reported that Chile has agreed to cede a seaport to Bolivia as a condition of a treaty of peace and alliances between the two States.

....There has been a Cabinet crisis in Portugal, owing to the failure of the Cortes to approve the financial scheme of the Ministry.

POINTS FROM PULPIT AND PRESS.

A MINISTER'S study table is pretty well supplied with current literature when to his own denominational papers is added THE INDEPENDENT. But he needs THE INDEPENDENT. No other journal can take its place.—*Lutheran World.*

....We sincerely trust that there is an increasing liberal element in the Roman Catholic Church. It may seem inconsistent with the infallibility of the Church; but we would much rather that people would be inconsistently right than consistently wrong.—*National Baptist.*

...." It is not the business of the Church to popularize Christianity, but to Christianize the populace." We do not know who is the author of that pithy sentence, but understand that it is a nugget of imported wisdom. Christian workers generally will do well to read, reflect and remember.—*New York Observer.*

....Take up all the modifications of Universalist thought since the "brand-new" statement made by Hosea Ballou, and every one will be seen to *be* a modification and not a substitution. The Newness of Orthodoxy has not even the shadow of a counterpart in the history of Universalism since the publication of the Treatise on Atonement.—*Christian Leader.*

....Those who have advocated the closing of the Fair on the Lord's Day are not, as a class, as energetic as those who seek its opening, just as liquor dealers surpass in energy friends of temperance In this, as in many other matters, the children of this world are wiser in their generation than the children of light. We hope, however, that this selfish, reckless scheme, plausible enough to deceive some intelligent and well-meaning persons, but transparent when steadily gazed upon, will fail.—*Christian Advocate.*

....But there are things which Higher Criticism must not do if it would retain any place in popular confidence It must not handle the Bible as if it were a literature merely; nor in any way or degree ignore its supernatural origin and quality. It must not restrict the Bible to the illusive tests of personal feeling, or the critical taste, or "religious consciousness," to the ignoring of those great objective verities by which the Book of books "certifies itself to be the Word of God." It must do nothing, say nothing, that shall in any form impair our sense of its divineness or its authority. It must never lose sight of the cardinal fact that the Holy Ghost is the inspirer, and so far the true "Author" of the Scriptures, and that holy men of God wrote as they were moved by him, is such sense that his presence is everywhere seen and felt in the sacred writings. It must never confuse truth with conjecture; propound hypotheses as facts; embarrass faith by indefinite suggestions; magnify slight discrepancies, and suggest changes where none are needed. In a word, it must stand honestly, reverently, meekly, by a real inspiration of the Bible as a whole, which makes it a supreme authority and guide to all truth and duty.—PROF. E. D. MORRIS in *The Evangelist.*

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PRESIDENT HARRISON'S ADMINISTRATION.

THE Administration of President Harrison will close the present week, and when it goes out of office the Republican Party will go out with it in both branches of the Government. It is a fitting time before the new Administration begins to make its record, to speak of that which President Harrison's has finished.

When the lapse of a little more time shall have allowed partisan passions to become cool it will be universally admitted that President Harrison has given the country a thoroughly clean, able and efficient Administration. There have been no scandals connected with it; there have been no blunders in policy or in performance. The interests of the country have been protected to the fullest extent, and many great difficulties have been confronted and overcome.

When we come to enumerate the public questions of supreme importance which the outgoing Government has dealt with, and dealt with successfully, we find that it has been emphatically a business Administration. When it was inaugurated two very important questions were pending—the Bering Sea controversy and the Samoan difficulty. The latter was ended satisfactorily to everybody; and the former has been some months before a court of arbitration and will be settled peacefully and no doubt equitably. Our relations with Italy were seriously threatened by the murder of a number of Italians in New Orleans. The Italian Minister was recalled and for a time war seemed imminent. But peace was maintained, Italy was pacified, and the matter satisfactorily adjusted. A still more grave difficulty arose between our Government and Chile, consequent upon an outbreak in a Chilean port against members of the crew of the United States warship "Baltimore." The President took a firm stand for our national rights and the protection of our citizens, and the war cloud which had spread over our sky speedily drifted away. The Chilean affair has become simply an historical incident.

In legislation no Congress since the days of reconstruction has accomplished more for the general good of the country than that which came in with Harrison's Administration. Not only did it thoroughly revise the tariff, putting sugar and many other things on the free list, and recognizing the right of new as well as old industries to protection; but it also adopted a reciprocity act by which new markets have been opened for us in South America and Europe. Among its most important acts, which it is now worth while to recall, were the anti-lottery, the administrative customs, the postal subsidy (by which direct marine communication with Central and South American ports was provided for), the French spoliation, the general land forfeiture, the general land revision, the division of the Sioux Reservation, the Congressional reapportionment, the State Agricultural Colleges' aid, the meat and cattle inspection, the original package, and the international copyright. In addition to these acts there was a variety of legislation designed to increase the facilities of the postal service and the efficiency of various arms of the Government. All this legislation was accomplished pursuant to the policy of progress and protection to which the Republican Party pledged itself in the campaign of 1888.

The appointments which have been made to the diplomatic and consular service, to the executive, judicial and other departments have been of a high order. It has fallen to President Harrison to fill four vacancies on the bench of the Supreme Court, and to name the first judges of the new circuit courts of appeal; and his manner of doing so has evoked the heartiest praise from men of all parties.

Under the Administration the Eleventh Census was taken. While the results of the enumeration were severely criticised, largely for partisan reasons, they have generally been accepted as among the most satisfactory ever obtained. Certainly the volume of the work was vastly larger than under any previous census.

One of the brightest chapters in the Administration has been its conduct of Indian affairs. Mr. Harrison selected for Indian Commissioner a thoroughly qualified expert in education, and General Morgan has systematized the management of the Indian schools so that the attendance has largely increased, and the efficiency of the system more than doubled. Meanwhile the process of breaking up the reservations and guiding the Indians to the high position of citizens has made such progress that, if not interfered with, their civilization and incorporation with the nation is only a matter of a few years.

While the Administration has not been above criticism, with respect especially to the numerous changes in the fourth-class post offices, it has made a substantial advance in the direction of Civil Service Reform. The railway mail service, most of the positions connected with the management of the Indians, and all free delivery post offices have been placed under the operation of the Civil Service law; while great reforms have been adopted, under General Tracy's administration, for the Navy Yards. In all the executive departments the merit system has been made dominant, and unquestionably the Administration leaves the public service in a far better condition than it found it.

As for the President himself, he has discharged his high official duties with such conscientious regard for the best moral sentiment of the country and for the interests of the American nation, and with such statesmanlike ability, soundness of judgment and firmness of decision, that he may justly be called a model President. He will retire to private life with the hearty respect of all whose regard is worth having, and with the enmity of those only whose approval is not to be coveted. We hope that four years hence the country will call him from his temporary retirement to be again the head of this great nation, whose prosperity he has done so much to advance.

THE COMING AGE OF ELECTRICITY.

THE last century records three chief American inventions. They were Benjamin Franklin's lightning rod, a machine for making nails, and an orrery. Thus one of the three was connected with the first important discovery in electricity, that which identified lightning as an electric discharge.

The next important electrical discovery was that with which the name of Morse is inseparably connected, the electric telegraph, also an American invention. Cyrus W. Field was the father of the Ocean Cable. The telephone was the invention of the American, Bell; and American inventors, such as Edison and Brush, have done more than their share in developing the electric light. Electricity is one of those arts or sciences which have especially attracted our countrymen. However it may be in literature or religion, the old dictum hardly holds true as to electricity, "*Ex oriente lux.*"

It is with the idea of giving to our readers some partial view of the extraordinary progress which electrical science has made during the past ten or twenty years, that we have asked a number of the most capable experts in the country to write on different branches of the subject in our issue of this week. We do not expect that our readers generally will understand all that is written. Much of it will daze and confuse them. Electricity could not become a science until some sort of scales had been invented to weigh its quantities, and terms had been contrived to designate them. But the very words *volt*, *ampere*, *ohm* and *coulomb* were adopted less than a dozen years ago, and a man thirty years old did not in his school days find the words in his text-books, perhaps not in his college days. But if the very language of the science is jargon to the common reader, he will yet be able to get from these articles a somewhat clear idea of the marvelous progress which has been made, and of the extension of electrical service in all directions where energy is required. This will be of great advantage even if he cannot understand the meaning of certain words which are as primary and alphabetic to an electrician as are such words as *pint* and *pound* to a grocer.

The shortest of all the articles in our series, by the Secretary of the New York Stock Exchange, will give some idea of the hundreds of millions of wealth invested in electrical stock. He only mentions those that are on the New York Stock Exchange. The electric telegraph is everywhere on the land, and crosses under every sea except the Pacific; and surveys have been made for a line to the Hawaiian Islands and from thence to Japan. There is no city so poor as not to have its streets lighted with electricity. Almost every town has its telephone exchange. Scarce a respectable house can be put up now without electric bells and burglar alarms; and what the future of electricity has to develop these articles will suggest.

But it is not merely the men who apply electricity to practical purposes to whom the world is indebted. We are and should be very grateful to the Fields and Edisons of electricity. But after all it is the men who are working not for immediate practical results but for the investigation of fact and the enlargement of knowledge to whom the greatest debt is due; for they are the men who open out the roads which the practical men may follow. How many of our readers have ever heard before of Nicola Tesla? His name will be found several times in these articles, and mentioned with a sort of reverence. Electricians speak of him somewhat as newspaper reporters speak of the Wizard of Menlo Park. It is as if one were speaking of a kind of magician, who had power over the most hidden arcana of Nature. Nicola Tesla's name is not in "Appleton's Encyclopedia of American Biography," but neither, for that matter, is another distinguished electrician whose name is among our contributors this week—Mr. Moses G. Farmer. Nicola Tesla is not an American by birth. He has come over as one of those foreigners whom some of our people wish to exclude from the country, and is probably the foremost student and discoverer in this department now living. It is on the work of such men as he that the state of anxious expectancy is founded which runs through some of these articles, and which awaits great discoveries that we may be on the eve of making; discoveries which must search into the most intimate relations of matter in their atomic conditions, and which require an insight into the meaning of the mysterious vibrations of ether on which all forces, whether of heat, light, electricity, magnetism or perhaps even gravitation depend. What can we not do when we learn how to transform the stored-up energy of coal into light without wasting any more of it on heat than does the skillful firefly?

We then commend these articles not simply to the student but to the general reader. They will be an education and an inspiration to those who cannot fully understand them; and they will direct some young men, we trust, who have the energy and the perseverance requisite, not only into paths of profitable labor, but, what we would much more desire, into the pursuit and investigation of those truths in physical Nature which are only less important than the truths of mental and moral science.

RACE-TRACK LEGISLATION IN NEW JERSEY.

THE people of New Jersey had no right to expect the present Legislature to make a clean and unexceptionable record. They did not take the pains last fall to elect the kind of men to make such a record. On the contrary, they carelessly elected candidates who have no regard for the moral side of public questions, or for those who do. Among the men chosen to sit in the Assembly and make laws for the State, were the notorious race-track proprietor in Gloucester and his "starter," Mr. Flynn, who sits in the Speaker's chair. These men did not have themselves elected to the Legislature simply for the honor of it, but for a more practical purpose, and that was to sweep away all the safeguards against the infamy of the race tracks of Gloucester, Guttenburg and similar places, which even the more respectable racing men do not contenance, but condemn for their immoral accessories and for the cruelties they involve to the noblest servant of man.

Last week this purpose was carried out in the introduction and rapid passage through both Houses of three bills, the effect of which is to legalize the immoralities and cruelties of these winter race tracks, and make it impossible for prosecutors or grand juries or courts to reach and punish them. To the credit of New Jersey, it has hitherto been an offense against the law to maintain places for betting on horse races. The bills which have passed both Houses make this flagrant offense a perfectly legal business, provided it is conducted on the race tracks and on the days when races are held.

The bills as passed went direct to the Governor, who

vetoed them with such surprising promptness that the next day his messages were read in both Houses. The bills were then laid over one day, under the rule, and the next day the House took them up with the haste of those whose feet run to evil, hurried them through and sent them to the Senate, which, equally subservient to the race-track gamblers, completed the legislative deal and passed them over the Governor's veto on the day following.

As the Constitution allows a bill to become a law if passed by a majority vote over a veto, these infamous bills have now all the force of law in the State of New Jersey.

The people, so quickly was the legislation hurried through, had no opportunity to present their protests, which they would have done as promptly and forcibly as they did last winter, when they compelled the Legislature to kill similar bills. It is a curious thing that the Governor should have acted with such unusual promptness. It was his right to hold the bills at least five days. If he had done so, an opportunity would have been given to the people to make their voice heard in the legislative halls at Trenton. It is charged by some that he had an understanding with the majority of both Houses to the effect that tho he felt he must veto the measures which he pronounces unconstitutional and contrary to the "enlightened popular sentiment" and to "sound public policy," he would do so as conveniently for their purposes as possible. They knew, at all events, when the messages were to come and what they were to be, and were prepared to act with the utmost promptness, so that before they could hear from their constituents or meet them at their homes at the end of the week, these infamous bills should have become a part of the statute law of the State of New Jersey.

This legislation is an insult to the intelligence and morality of the people of New Jersey. They ought to resent it, and resent it promptly and forcibly, and there is no doubt that they will. It is a legislation against public decency, against public morals, and in the interest of gamblers, thieves and prostitutes. These winter race-track courses are places of infamy. And now the Legislature has fastened them upon the State and put it beyond the power of the peace officers to abate them as nuisances or punish those who commit, in connection with them, crimes against public morality.

The name of every man who voted for these bills should be black-listed, and such a storm of public indignation should sweep over the State as will compel them to pass a repeal bill, and at the end of their term send every one of them back to obscurity and into oblivion.

HAWAII AT WASHINGTON.

WE make not the slightest objection to all necessary consideration of the proposed treaty for the annexation of Hawaii; but it ought not to take long to consider it. The people ought by this time—they ought years ago—to understand the value of those Islands to the United States, and they ought also to require little time to apprehend the value of the United States to those Islands.

The objections which have been raised are of the flimsiest nature. We have read with some care the objections urged, and they do not seem to rise above the intelligence of a brute animal which pulls back when led by a string.

The one which seems to be most urged is, that it will, it is supposed, please Claus Spreckels, the wealthiest man in the Hawaiian Islands. If that is true, it ought to be a reason for annexation, not a reason against it. He is supposed to be an intelligent man, one who knows what is for his own interests and the interests of Hawaii; and if he thinks it would be a good thing for them, it is an argument, so far as it goes, in favor of the treaty. What is a benefit to Hawaii, is probably a benefit to us. What helps one country generally helps another. We do not get good or great by injuring our neighbors, but by helping them.

But it is said he wants to sell sugar here. Well, why shouldn't he? And why should not he or other men like him sell sugar here and make money by it? We shall get our sugar cheaper, and he will make more money by larger sales. That is good business; that is profitable to both sides; we do not begrudge the extension of business, but regard it as a blessing to the countries or States or cities that have the trade. Certainly it will give us cheaper sugar—which is what both parties and all sensible people want—at the same time giving larger business and more profits to the producers in Hawaii, and larger savings to the consumers here. Why, in the name of common sense, should any one who knows enough to distinguish policy from idiocy object?

But a few sugar producers in Louisiana say it will cut down the price and profits of their sugar. Well, the rest of us, forty-three States, do not need to be sacrificed to the fancied interests of a few sugar planters in Louisiana. Louisiana and Hawaii together cannot make all the sugar we need. There is room for both to have an abundant market. But we can pardon Senator Gibson for his opposition. The dog guarding his bone is more to be respected than the dog in the manger.

But then come those who are afraid of annexing an island of ignorant and savage South Sea Islanders with war clubs and without breechclouts. Well, they are not South Sea Islanders, and they have no war clubs, and they wear trousers, and they are not savage or ignorant. A larger proportion of the native Hawaiians can read and write than of native Georgians or Virginians or Pennsylvanians. They have had for years a compulsory education law, and it has been enforced. They are civilized, respectable people. We have heard people object to admitting them who supposed that not half of them could read. Ignorance, not the ignorance of the Hawaiian, but of the American editor, is at the bottom of half the opposition.

But the rights of the Queen and of the young girl who is on her way from England to appeal to the generous American people that her succession to the throne may not be imperiled! Rights of the throne indeed! What rights have a family of men or women to rule? Are we royalists here? Do we believe in the divine right of kings, or do we really believe that the same right of free, popular government which we claim belongs also to any other people that can get it? The talk is treason to our own institutions.

But the Hawaiian people don't want to be annexed, we are told. Well, wait long enough to find out. We say they do. Our correspondent, pastor of one of the churches in the Islands, tells us this week what they want. Our American missionaries represent the people, and they say annexation is the thing. It is only a few of the lowest of the people that oppose, men who are still afraid of a witch doctor.

But Hawaii is so far off! There it is at last, the stupidest of all objections. Hawaii is at our doors. It is nearer than Alaska, more accessible to us. It is much nearer than Oregon was when Daniel Webster said it could never become a State because its representatives could not reach Washington until the Congress to which they had been elected had adjourned. Those who offer this objection ought to have lived before the age of steam and electricity. Where was California before the Pacific Railroad? How long did it take then to cross the plains? Was it foolish to annex the territory west of the Rocky Mountains?

The objections to annexation of Hawaii are a trial and an insult to common sense.

Editorial Notes.

THE issue of this week is enlarged to forty pages in order to make room for a series of articles by men of the highest qualification on the subject of electricity and its appliances in this electric age. Park Benjamin, one of the most trustworthy writers on this specialty, takes a look into the future of electricity; A. B. Chandler, President of the Postal Telegragh Company, gives a view of the history of the telegragh; George G. Ward, General Manager of the Commercial Cable Company, has a valuable paper on ocean cables; Hammond V. Hayes, an expert in the subject, describes the telephone; electric lighting is treated by Nelson W. Perry, editor of *The Electrical World;* Prof. W. W. Share, of the Adelphi Academy, treats of electric railways; Gen. E. S. Greeley speaks of electricity as applied to household affairs; William L. Saunders speaks of electricity in mining; Prof. George F. Barker discusses the storage of electrical energy; the distinguished inventor and electrical authority, M. G. Farmer, writes on electricity as applied to warfare; George N. Hopkins, editor of *The Scientific American*, speaks of the household use of electricity; Professor Crocker, of Columbia College, describes a course in electrical engineering; the Secretary of the New York Stock Exchange, Mr. George W. Ely, gives a list of electrical stocks and bonds dealt in in this city; and W. A. Bardwell, of the Brooklyn Library, gives information about the literature of electricity. The Hon. L. E. Chittenden gives an amusing experience in trying to feed starving rebels; James Payn presents some unpublished letters of Wordsworth; and the Rev. T. L. Gulick reports the Hawaiian revolution. The poems of the week are by Archibald Lampman, J. Russell Taylor, Elizabeth W. Fiske, George Cotterell, and P. McArthur; and the stories by Isabel Gordon, Alphonse Daudet, and Robert Beverly Hale.

PRESIDENT CLEVELAND completed his Cabinet last week by the appointment of a Southern man, Congressman Hilary A. Herbert, of Alabama, to the Navy Department, and a New England man, Richard Olney, of Massachusetts, to the Department of Justice. The appointment of Mr. Herbert, who has been chairman of the House Committee on Naval Affairs, and is thoroughly posted on the subjects belonging to that department, has been received with words of the warmest commendation. He will make a worthy successor to General Tracy, whose administration has been one of the proud achievements of the last four years. Mr. Olney, tho not so widely known as Mr. Herbert, is well fitted by training and experience to conduct the business of the Attorney-Generalship. We commented last week on the distribution of the Cabinet positions between the various sections of the country. The South gets two, New England one, New York two, the Middle West, one and the Northwest the other. No reasonable criticism can be made of this distribution. All the sections except the Pacific Coast are fully represented; and it has been the practice, at least since General Grant took Attorney-General Williams from Oregon, to pass over the claims of the Pacific Coast. Of course the Senate in special session will confirm these Cabinet appointments without delay, and the new Administration will soon be in full working order. It is the hope of every true patriot that it will conserve all the interests of the country and give us a good and efficient government.

IT must have been a matter of peculiar gratification to President Harrison to issue, as one of his last official acts, a proclamation removing the discriminations which had been imposed by a previous proclamation on Canadian vessels passing through the Sault Ste. Marie Canal. These discriminating tolls were levied in accordance with an act of Congress, because of the unjust discriminations which Canada insisted on maintaining against trans-shipped goods of the United States passing through Canadian canals. When our Government made a protest against these discriminating tolls Canada refused to abolish them directly, and proposed a compromise which was not satisfactory to the authorities at Washington. Now the Canadian Government has issued an order abolishing the discriminations complained of, and under date of the 21st of February, President Harrison made a proclamation, directing that the additional toll collected of Canadian vessels in the Sault Ste. Marie Canal should be discontinued. We are glad to have this incident end in this way. We do not want any quarrel with our Northern neighbor. All that we desire is that our rights shall be recognized, and we should certainly be willing to recognize in return the rights of Canada. We ought to live together on the most friendly terms. We cannot choose but be neighbors, unless our Northern friend should request a closer relation, which we are entirely ready to grant.

To illustrate the silly talk of those who oppose annexation of the Hawaiian Islands we may read the little paragraphs scattered, after a modern journalistic fashion, here and there over the pages of one issue of *The New York Herald*, which opposes annexation, which its lively rival, *The Sun*, favors. The first paragraph says that "a few active volcanoes" are all we will get by annexation, except "a hundred thousand semi-civilized savages." The total population is ninety thousand, of which less than half are of the native race, and all can read and write. The next says annexation throws overboard our immemorial policy "to enrich a few adventurous sugar planters and open a new field for lobbyists, infringers and carpetbaggers." As if we had never had any annexation before, and as if these white natives of Hawaii were carpetbaggers! The next says that "the Sandwich Islanders themselves do not ask us to annex them," and that "the petition comes from a small minority of the population, mostly of foreign birth." The statement is utterly untrue. The bulk of the white people who have taken the lead in annexation are natives of Hawaii but of American parentage. The bulk of the native Hawaiians want annexation. Says the next paragraph:

"However desirable Hawaiian annexation may be to a parcel of adventurers, speculators, sugar kings or even to our own Government, as furnishing convenient harbors of refuge and depots for supplies, it must be confessed the methods adopted to consummate the *coup* are not of a kind to be honestly admired."

If such men as Dole and Thurston and Spreckels even are a parcel of adventurers, then so are Judge Daly and Chauncey M. Depew in this city; and no more honorable methods of seeking annexation could be contrived. The next says the movement is engineered by the Hawaiian Commercial Company. Any one who reads the names of the Provisional Government ought to know better; but if it were true, they are a more decent set of people than the Queen and the Lottery men and the witch doctors who oppose it. The last is: "A heap of volcanic islands two thousand miles away." That *is* argument. We would not object to having the most magnificent volcano in the world. It is rather needed to balance Niagara.

GOVERNOR WILLIAM MCKINLEY, JR., of Ohio, has met with an overwhelming financial reverse through his kindness in indorsing the paper of a friend. This friend has become seriously embarrassed in his business, and Governor McKinley has been called upon to make good the notes bearing his indorsement. The amount is large enough not only to sweep away the Governor's own modest fortune but also that of his wife, who has cheerfully offered to surrender all her private means, which came from her father, in order that her distinguished husband may fully meet his obligations. The conduct of Governor McKinley is most honorable to him. He might have saved his wife's fortune, and most men would have excused him for it; but he would not take advantage of a legal right, even to help him in a transaction in which he receives no benefit whatever, but surrenders everything. The hearty sympathy of the country has been expressed for him, and every mail has brought him offers of assistance and even of outright contributions to help him through his difficulties. He was very much touched by this expression of public regard, but has given notice that he cannot accept the offered contributions. It is to be hoped that the business of the firm which has swallowed up his money will be so adjusted that the loss to him shall not be a total loss.

SOME of the Democratic papers are trying to make a point of the fact that whereas when the Harrison Administration took office it did so with a Treasury containing nearly two hundred millions of dollars, while the incoming Government will receive with the Treasury portfolio only about $104,000,000. They speak of the "squandering" of the difference during the last four years. What a nonsense this is. Does not everybody know that the fact of a large surplus was the reason that the country insisted upon a revision of the tariff? And the result of that revision was to reduce the receipts for customs duties, and as the expenditures of the Government could not be decreased

there is naturally a smaller amount in the Treasury. But a surplus of $104,000,000 is amply sufficient, and there is no fear of bankruptcy while such a balance is to be maintained. The difference between the customs receipts for the latter half of the outgoing Administration and the customs receipts for the previous years, represented chiefly by sugar, has gone to the benefit of the whole country. The Fifty-first Congress, which has been stigmatized as a "Billion Dollar Congress," was not a more expensive one than the Fifty-second has proved to be. The fact of the matter is that we need sufficient money to carry on the Government of this great Republic, and the people do not object to reasonable appropriations. The Democratic policy of former years was really niggardly, and resulted in the crippling of the postal service, in the closing of the United States courts, and in other similar results which are not to be accredited to economy but to stinginess.

THERE is an old Greek proverb that Jupiter himself cannot guard against a fool, and no human precaution can protect one against the freaks of insanity. This time it is a man driven out of his head by misfortune and age, named Rippey, who first shot the California bonanza millionaire, John W. Mackay, and then fatally shot himself. The last parallel case was the attempted murder by an insane man of Dr. John Hall, and similar cases were the attempt on the life of Mr. Sage, in this city, and the killing of President Garfield. We should like to draw some kind of a lesson or moral from the affair, but, as we have said, insanity and folly are governed by no law, and are amenable to no sort of reason or precedent. In this case the old man who fired the shot, which we trust will not prove fatal, was a confirmed speculator, seventy years old; and all we can say is that if, instead of alternating between the barroom and the broker's office, he had lived an honest and diligent life, tho he might have become crazy, his craziness would not have led him to attempt the murder of a millionaire nor probably of any one else. He would have had no occasion to brood over what he called his misfortunes or to fancy that he was injured by anybody. We would like to draw a lesson about the danger of large fortunes speculatively acquired, but there seems no occasion for such a lesson in the present occurrence.

SOME of the daily papers tell us of a scheme of the Catholics of New Jersey to have the State adopt their parochial schools into its public system, but at the same time it is said that there is little likelihood of any bill being introduced into the New Jersey Legislature looking to such an arrangement "as the present sentiment in the State is quite averse to the success of the undertaking." We do not question that it is. There is no evident change in public sentiment as to keeping our free schools free of all entangling alliances, while there is a marked change in the free expression of Catholic sentiment on the public schools. Mark, we do not say that there is any great change in the attitude of Catholic parents toward public schools, for they have all along patronized them freely, except as they have been prevented by the priests; and still the large majority of Catholic children are in the public schools. The change is in the liberation of the tongue and the press to approve what has been practiced, and to resent scandalous libels on our schools. The plans suggested for having the State adopt the parochial schools all look to their secularization during school hours, and putting them under teachers possessing the certificates required by the State, and placing them under the superintendency of the school officers of the State. It is only necessary to go a very little further. Let the children mix with other children in our public schools, and then let their religious education be carefully provided for as you please.

THE introduction of a good, courageous Home Rule bill for Ireland does not seem to have hurt the Liberals with the people of England. There have just been two by-elections, of which one was at Cirencester, the previous vote having been a tie, and the Liberal candidate, Mr. Lawson, was elected over his previous Conservative opponent by a majority of 242 out of a vote of 9,000. This the first election after the introduction of the Home Rule bill, and Mr. Lawson declared himself in favor of it, being opposed by the combined Conservatives and Liberal Unionists. The Conservative candidate was supported by the liquor dealing interest and by all the influence of the landed gentry and the Church. The second election was at Gateshead, where the Gladstonian majority, which was 293 at the last general election, was increased to 868. At a third election a Conservative majority was cut down five hundred votes. Mr. Gladstone is not allowing any delay in the introduction of other important measures. A bill for the reform of the ballot, allowing only one vote to one man, and another bill looking toward the disestablishment of the Church in Wales, have both been introduced and passed their first reading. Everything continues to look bright for the Liberals.

IT is a serious lesson which the Springfield *Republican* has been teaching us by its statistics of homicides in western Massachusetts. It finds that the number of murders committed in the sparsely settled hill towns is considerably greater in proportion to population than in the thickly settled manufacturing communities. Thus convictions for twenty-two murders were found in the four western agricultural counties in the last twenty years, while Essex County, with a larger population, had but eight. Of the twenty-two murders, eleven were in nine towns with a combined population of 8,331, while during that time not a conviction is recorded against Springfield, with a population of 44,179. The murderers are not from European slums, but from us, committed by natives of ancestral residence. The *Republican* says:

"If this inquiry teaches anything at all, it is that where the population is sparsest and the religious, social and intellectual possibilities of advanced civilization are fewest, there murder is most rampant and unrestrained. The native heathen at our doors need attention. . . . In our small towns in western Massachusetts the police arm is practically powerless. It will never be strong or in any way able to cope with the tendency to crime if its only source of power is the community itself. These small agricultural townships have become wofully poor in comparison with the manufacturing centers, and many of them have hard work to carry on town government decently. As is well known, they are too poor to maintain even good country roads. The practical lesson of this inquiry, therefore, is this: The State or county must maintain, or at least invigorate, the police power of these sparcely settled districts."

Certainly the large and wealthy churches of the cities must see to it that these sparsely settled hill towns are not paganized. If the churches are given up we must expect more crime.

ONE of the comicalest incidents of the Catholic controversy is furnished by *The Catholic Times*, whose editor has received a letter from a priest inclosing fifty dollars to be sent to the Pope as a token of gratitude for his action in establishing a permanent Apostolic Delegation in this country—we add, tho he does not say it, for the protection of priests and parishes against occasional tyrannous or even insane bishops, for such there have been. But his gift was accompanied by the "pathetic and significant request: 'Please keep my name and diocese secret.'" Our Buffalo contemporary says:

"His reason for making this singular request was no doubt his fear of his ecclesiastical superiors. He feared the frown of local authority and felt that if his crime were once discover d he would have to bid a last adieu to future promotion. So he attempts to get his present sent to the Pope surreptitiously. The new departure has taken his breath away, and he cannot realize that the days of Mandarin government are past, and that he is a free man. He need not fear; we will keep his terrible secret. His present is on its way to Rome. It will be delivered to the Holy Father by Mgr. O'Connell, who is requested, on presenting it, to tell the Pope in confidence the name of the donor, and ask him to keep the name and the diocese secret."

....New Jersey is blazing with indignation against the Legislature which has compromised the honor of the State by legalizing gambling and other corrupt practices. Indignation meetings were held in all the chief cities last Sunday, and a general demand has been made on the members of the Legislature to repeal these infamous laws. In order to avoid the uncomfortable pressure which is likely to be put upon them in the next two or three weeks, the members of the Legislature now propose to reach a final adjournment, if possible, this week. There is no question that the passage of these bills was determined long before the election last fall; indeed, the proprietor of the disgraceful Gloucester race track, who by virtue of the grace of his constituents has the right to use Hon. before his name, clearly intimated that some of those who voted against the bill had received money from the race-track men for their election expenses. It is said that a quarter of a million dollars was required to get the bills through. This shows the extent of the corruption wrought by this infamous business, and also how enormous is the sum of money lost at these gambling resorts.

....It was a pleasing visit which President Harrison paid to this city on Washington's Birthday to hoist the American flag over the magnificent steamer "New York," which, under the law passed by the Republican Congress, now becomes an American bottom. She belongs to the Inman Line of ocean steamers and was built abroad. This line now becomes an American line, and on condition of accepting the ships already under charter, tho built abroad, additional ships will be built in this country as needed. This is a long step toward the restoration of the American marine. We hope no backward step will be taken during the coming Administration. President Harrison, in hoisting the American flag, expressed the conviction that "We have reached an epoch in our development where the great work of internal developments is so far consummated that we may successfully take up the work of recovering our fair share in the carrying trade of the world." Our legislators in Washington can have no more important object than this.

...The managers of the World's Fair are so anxious to have the Fair open on Sunday that they seem willing to take advantage of any technicality, or even to do an act of bad faith in order to carry their wishes. Failing in their attempt to induce Congress to repeal the conditions annexed to its appropriation, failing in all their other schemes to get round the laws and have open gates, it is now proposed that they refund the money to the Government. This is utterly impracticable. The coins could not be all gathered up and returned, and besides there are two parties to the contract, and it would not be possible to get the consent of the second party. The zeal which the friends of Sunday opening have shown would have gone a long way to make the Fair a great success if manifested in more practical and less objectionable ways.

....Secretary of State, John W. Foster, who succeeded Mr. Blaine, and whose administration of the department for the brief time he was at the head of it, has been admirably efficient, resigned last week a few days before the expiration of the Harrison Administration, in order to sail for Paris, where he is to represent our Government before the Bering Sea arbitrators. The cases, as they are called, of the two Governments, have been exchanged, and argument is now to be heard before the arbitrators by representatives of both sides.

....We prefer to use the name of this country as a compound noun with a singular verb. We say "The United States *is* a nation," not "*are* a nation." But we observe that in one of the Hawaiian documents lately furnished by our State Department the verb following the name of the country is always plural, as if the United States were negotiating as separate entities and not as a single government. Since the War we have the right to claim to be a nation as well as States.

....While Mr. Cleveland is proceeding to map out the appointments and policy of his Administration without regard to the great majority of the Democracy in the State of New York, giving no sign so far of intention to recognize what is known as the "Snapper" element, Senator Hill and Tammany, on their part, give every indication of a determination to do what they can to prevent his Administration from being a success. Cleveland men are being turned out of office and anti-Cleveland men put in their places. Last week a resolution of commendation of the President-elect was offered in the Assembly, which is overwhelmingly Democratic, but the House would not even permit it to be read. The new President will probably be able to get along without the help of Senator Hill and his followers. But will Senator Hill and his followers be able to get along without the friendship of Mr. Cleveland?

....The Supreme Court of the State of Kansas on Saturday last decided a test case brought before it in favor of the Republican House, recognizing that and not the Populist House as the legal Assembly of Kansas. To the credit of the Populist House they resolved at once to bow to the decision of the court and take their places with the Republican House at the meeting on Monday. We rejoice in this peaceable triumph of justice. There is no question, we suppose, that the public opinion of Kansas was strongly against the position taken by the Populists, and if they had continued their opposition to the legal organization of the Lower House, and brought about bloodshed, they would have speedily found themselves without a party behind them. There is now little doubt that the election of Judge Martin as United States Senator was null and void, and a new election by the properly constituted House and Senate will follow.

....The public school system of Georgia began in 1871, but in 1872 the schools were suspended, to be resumed the next year. In 1876, the appropriation for public schools for the whole State was $149,465. Last year it was $951,700, besides what is realized from the poll tax paid direct to the county commissioners, and which amounted to about $215,000. There has been fair progress, and yet scarce half the children are in school, and the terms are very short, the full period being one hundred days, except where certain cities provide for a longer term by taxation. Altho a law passed by the last General Assembly allowed counties to provide for schools by local taxation, no county has yet availed itself of the privilege.

....Renewed attention is called to the brutality of the best military establishment in the world. A non-commissioned officer had been unusually brutal to a German recruit of good family, who eventually was driven to suicide to escape the degradation to which he was forced, but not before he had written a letter to his parents giving a full account of what he suffered. This letter was sent by them to the Emperor who has caused the arrest of the brute. A result has been the discovery of the fact that out of 127 deaths in the army during December last, twenty-four were suicides, mostly caused by desperation at the tyranny of non-commissioned officers. But war is essentially brutal.

....We are glad for the Episcopal Church, not of this city alone, but of the country, that Dr. Huntington, of Grace Church, declines to be a candidate for Bishop of Massachusetts. Knowing him intimately as they did as a Worcester rector, we are not surprised that the Episcopalians of that State desired him as their bishop; but the position he has won for himself as leader of the House of Delegates in two General Conventions makes him more influential than he could be as a bishop. Indeed, he occupies very much the position of an active and successful leader of the House of Representatives, who would be retired by being elected Senator.

....The Senate has confirmed the nomination of Judge Jackson to be Associate-Justice of the Supreme Court, and President Harrison has nominated Benton Hatchett, of Michigan, to be Judge Jackson's successor as Circuit Judge for the Sixth Judicial District. There is some doubt about the Senate confirming this nomination. It comes close to the end of the Administration, and the Democrats naturally think that Judge Jackson, being a Democrat, should have a Democratic successor.

....It is now quite clear that the Senate will be organized by the Democrats. They have sufficient members to do this without the help of the Populists, who have announced that in general they will help the Democrats and not the Republicans. It seems very strange to have Democrats representing such stanch Republican States as Kansas, North Dakota and Wyoming. In some of these cases the bad management of the Republicans was at fault.

....Louisiana arose in her strength when the gamblers had taken possession of the Legislature, and turned them out and destroyed their privileges and their places of business. The gamblers of New Jersey have laid their plans and captured the Legislature of that State. Have the people of New Jersey as much moral fiber as those of Louisiana? We shall see. The race-track question ought to be the chief issue of the next election.

....The Democrats continue to feel very sore over the appointment of Judge Gresham to the chief place in Mr. Cleveland's Cabinet. They refuse to consider him as a Democrat. In the Senate the other day Senator McPherson, of New Jersey, spoke playfully of the fact that after the fourth of March the Democratic Party would have the Senate, the House, and "at least a part of the Cabinet."

....It is very good of our late Consul to the Philippine Islands, who has collected a fund of Mohammedan money to begin a mission to convert us to the Moslem religion, to tell us that he does not intend to introduce polygamy. We have had one mission of that sort, and it was enough.

Religious Intelligence.

MOODY AND SANKEY IN BALTIMORE.

BY THE REV. E. A. LAWRENCE.

IT is now fourteen years since Mr. Moody led a great work in Baltimore. In that interval there has been no general awakening. For the two previous winters most of the Presbyterian and related Churches have joined, by small sections, in evangelistic work, with good results. Last fall there was a movement to secure the services of the Rev. B. Fay Mills, but it failed through the unwillingness of many pastors to assent to Mr. Mills's conditions. Mr. Moody has often been solicited to return to Baltimore, but has hitherto declined, partly, it is said, because he considered it already one of the best evangelized cities in the country, partly through the lack of a suitable hall in which to hold the services.

But while at Wilmington recently he consented to listen to proposals for his coming, and on learning of the facilities for work, accepted the invitation for two weeks, which have been now increased to three. When here before the circumstances of his visit were very different from those to-day. He had really come South to spend a winter here for his health, and the six months of his stay were passed in steady daily work in the churches. There was no large hall, and he went from one part to another of the city preaching in a great number of churches. Moody's converts are favorably known all over the city to-day, and it was largely through their exertions that he has returned. Now these same converts are among his best helpers, and some of them are rejoicing in seeing their children brought into the kingdom under the same influences that converted the fathers. "Why, Will, my boy's name is down on one of the Inquirer's cards," exclaimed one of them the other day, in greatest joy.

There can be no question that the whole city is profoundly stirred. The Cyclorama building, the use of which was secured for three weeks, will hold five thousand people. From the start it has been full at almost every service. Often hundreds have been turned away long before the hour of opening the meeting. Overflow meetings are held in adjoining churches and theaters. The clergy of all denominations are on hand. And the audiences are composed of every class and sect, including Catholics. In the afternoon the service is for women, in the evening for men. This week admission is to be given only by ticket. The weakest part of the whole is the music, for the large choir sings poorly, and cannot be redeemed by the best of Mr. Sankey's singing.

Mr Moody is himself. Those who worked with him fourteen years ago speak of his growth, to which he himself often alludes. His homely dialect never seemed more telling, his quaint humor more keen, his home-thrusts more searching, his exposition of truth more vigorous or refreshing. His sermons are often remembered as the same preached here before; but there is a new power about them, as well as new illustrations. His constant good humor and thoughtfulness for the comfort of his audience puts every one else in good humor, and incline them to be pleased. To his methods I have not heard one word of objection made. Their freedom from all that is sensational or merely emotional, their good sense and informality commend them to all, and many who object to the strategic methods of Mr. Mills, and his extensive use of converts' cards, work heartily with Mr. Moody.

The work has been somewhat hampered by the lack of proper inquiry rooms. Failing to secure any church in the vicinity, the main floor of the Cyclorama has been used for this purpose. Already about a thousand inquirers' cards have been handed in, and the number of those seriously interested would probably be twice that. But the privacy needed for such work cannot be secured, and there are obstacles which only the grace of God can overcome. Nearly every pastor in the city, however, has found some of his flock or acquaintance coming to him, with deep concern for their own spiritual interests, eager to begin or to renew a Christian life.

Most refreshing in all these meetings has been the entire absence of financial claims. An energetic committee undertook the raising of the necessary funds for incidental expenses, at the start by subscription, and not one word relating to such matters has been heard in any of the meetings. All sectarianism, too, seems swallowed up in the great enthusiasm for the kingdom of God and the salvation of souls. It seems certain that a great and abiding blessing has come to us with these evangelists.

When they entered the city they were greeted by a company of some three hundred Endeavorers, who sang a song of welcome. Should those who have been in some way aided by them during their stay go out to speed the parting guests, the streets around the station would not hold them.

BALTIMORE, MD.

THE PROTESTANT CHURCH IN RUSSIA.

BY PROF. GEO. H. SCHODDE.

IT is manifestly the determination of the Russian authorities to crush all religious dissent throughout the length and the breadth of the vast Empire. The ideal of Czar Nicholas, "One Empire, one tongue, one Church," has been revived in an acuteness never before exhibited. Especially are the Protestant churches in the Baltic Provinces the sufferers. As the highest intellectual and spiritual force in the entire Empire, and consequently the most stubborn opponent of the Russification process, Protestantism has aroused the special ire of those high in State and Church, and a veritable crusade against her existence is being relentlessly carried on. More than one-tenth of her ministry have been deposed and banished; old rights and privileges have been withdrawn; her schools are being destroyed, and even the great Dorpat University is being slowly strangled. Scarcely a week passes in which some measure of suppression is not promulgated. There is method in the madness, and the state of affairs is even worse than it was when the Basel Convention of the Evangelical Alliance sent a delegation to the Czar to present a petition for his Protestant subjects. These facts make a brief survey of the Protestant churches in Russia a matter of special interest.

There are three groups of Protestant churches in Russia, entirely distinct in origin and history. These groups are the Protestants in St. Petersburg, in the Baltic Provinces, and in the Interior Provinces. The first and last groups are the descendants of immigrants, chiefly Germans and Lutherans, invited to settle in Russia by Peter the Great and Catharine I, and promised full religious liberty. The Baltic group consists chiefly of Esthonians and Livonians, altho the leading classes, the aristocracy, business and professional men, are nearly all Germans. There are no Russian Protestants.

The St. Petersburg Protestants came from all parts of Western Europe, and at first, in the days of Peter the Great, constituted a single congregation. As their numbers grew, they divided into separate congregations, according to language and nationality. At present there are more than 90,000 Protestant Christians in the Russian metropolis, of whom the great bulk are Lutheran. They are organized into twenty-one congregations, and five missions in the city itself. Of these congregations fifteen are Lutheran, and six are Reformed. They possess eighteen churches, the disparity between churches and congregations finding its explanation in the fact that in a number of cases two congregations, differing in language, make use of the same house of worship. The Protestant clergy in the Russian metropolis number thirty-two. Each congregation there averages 4,286 souls; there is one church for every 5,000 souls; and one pastor for every 2,813. The increase in the number of churches and of the clergy in the last thirty years has been noteworthy, and is in advance of the growth of the Protestant population. During these three decades the number of pastors has increased 20 per cent.; six new churches have been erected; the seating capacity of the churches has increased 34 per cent. There are, in addition, ten mission stations in the suburbs, served by the same number of pastors. Every Lord's Day Protestant services are held in St. Petersburg in nine languages —namely, German, French, English, Dutch, Russian, Finnish, Swedish, Esthonian, and Livonian. These congregations are virtually independent, and enjoy a greater degree of self-government than they do in some of the States of Western Europe. In this regard they can be compared with the Congregational and Lutheran Churches in England and America. All the St. Petersburg congregations are personal and not parochial. Thus, the place of a man's residence does not decide to which congregation he shall belong. Directly or indirectly, the congregation select their own pastors and church officials, and these again are answerable chiefly to the congregations. Some of the congregations are possessed of so much property that the income from this source almost entirely covers their expenditures. In other cases the members contribute according to their ability. No aid is received from the State. All are liberal givers. Educational work is carried on by them on a grand scale, and they have also thoroughly organized their charitable work. In the esteem of the public the Protestants of St. Petersburg stand high. Some of the Protestant pastors are very influential in high places, and among the thinking portion of the Established Church, the spiritual character of Protestantism is keenly appreciated as compared with the petrified formalism of the Orthodox Church and the immoral lives of many of the priests

The three Baltic Provinces of Kourland, Livonia and Esthonia have, since 1523, constituted a solid phalanx of Lutheran Protestantism. Of the 2,000,000 inhabitants only 200,000 are Germans; but these constitute the wealthy, the educated and leading classes. The clergy, almost to a man, have received their education in Germany, and the pastors remain in touch and tone with the development of religious and theological thought in the Fatherland. The traditional rights of the Protestant Churches, sworn to be preserved by all the rulers that have managed their destinies, have been broken only by Nicholas I and Alexander III. Under some of the Russian Czars these Protestants enjoyed greater religious liberty than they did under the Kings of Sweden. Especially were Catharine II and Alexander II favorable to them. One great difficulty is that the bulk of the congregations and members do not belong to the same nationality with their pastors and the nobility. Movements, however, inaugurated repeatedly to make a serious break between pastor and people, have failed. Serfdom was abolished there nearly two generations before this was done in the rest of the Empire. This was accomplished in 1846, and twenty years later peasants were permitted to buy property. The material and intellectual prosperity of these Provinces is greater than that of any other districts in the Empire. The University of Dorpat ranks with any in Germany. The ecclesiastical government of the Provinces is in the hands of six consistories, under the general control of the Higher Consistory in St. Petersburg. The number of congregations is 316, with 342 pastors. The average number of souls to a congregation is 7,197. The Baltic Protestants are very pronounced in their evangelical faith, and the present persecution will not crush them.

The Protestants in the Interior Provinces, descendants of colonists, are chiefly settled in two districts, one along the Volga, the other in Southeastern Russia, and north of the Black Sea. There are, however, many Protestants scattered in other provinces, also in the Caucasus and in Siberia. On the Volga there are about 200,000 Protestants, who have converted these steppes into a paradise. In the southeastern districts there are some 150,000 Protestants, in 34 cities and 250 larger and smaller villages. They constitute 34 parishes. In all the Interior Provinces there are about one million adherents of the Protestant faith. The great bulk of them are Lutherans, the Reformed constituting from 7 to 8 per cent. only. The majority of the parishes are exceedingly polyglot, particularly in the Crimea and in Siberia. As a rule they are sincere and earnest Christians, eager to hear the Word, and distinguished from their Orthodox neighbors by a thorough evangelical life.

COLUMBUS, O.

RELIGIOUS NOTES.

THE members of the Lutheran Young People's Association in New York State are planning for a State Association. This will be the first State body in that organization.

....The Presbytery of New York, at a meeting February 20th, took up the subject of the Revision of the Confession, but, after hearing several motions and amendments, laid it over until March 5th.

....Revival services are being conducted this week in the new hall of St. Bartholomew's Parish House. Among prominent persons who will address the meeting are George Evans, of England, and Col. H. H. Hadley.

....The Sunday-school of Bethany Church, Philadelphia, has a total membership, including scholars, teachers and officers of 3,071. There are 100 classes, and the average attendance for the past year was 2,267 aside from visitors. Of these were an average of 288, making the total 2,555.

....Those who have heard with so much pleasure the addresses of the Rev. J. G. Paton, the veteran missionary to the New Hebrides, will be interested to learn that a son has recently been ordained in Melbourne, Australia, as a missionary. He expects to take up his father's work and will proceed soon to Malicolo.

....The aggregate attendance at the Fulton Street daily noon prayer-meetings in New York City, for 1892, was 13,226, an average of a little over 40. The founder, Mr. J. C. Lanphear, and a few of the original friends of the movement, are still in daily attendance. The number of requests for prayer received by letter was 8,755.

....Evangelist E. P. Hammond, who has been at work during the winter along the Hudson is now holding meetings in Albany. Dr. Chapman has commenced a series of meetings in Springfield, O. All the churches and pastors, as well as the faculty and students of Wittenberg Seminary and college are joining heartily in the work.

....The Bible Revision movement has made itself felt even in Russia. The Holy Synod has decided to take the matter in hand, and has intrusted the undertaking to a number of prominent Russian theologians and scholars. The movement is being pushed energetically, and the revision is expected to be ready for publication in two years. The Czar has approved the project.

....A young man, Mr. A. R. Vosburg, an ardent disciple of the Christian Science doctrine, recently applied to the Presbytery of Genesee for ordination. After somewhat lengthy discussion ordination was refused by a unanimous vote, on account of his position on that doctrine. The Presbytery, however, received him under its care, in the hope that he will in time change his views.

....In August, 1894, the semi-centennial of the Young Men's Christian Association movement will be celebrated in London, it being thought that on this jubilee year the World's Conference should be held with the parent association. George Williams, the founder, hopes to be present, and it is expected that an excursion will be arranged to accommodate a large number of Americans who will attend the convention.

....The General Council of the Catholic Summer School has decided to accept the large grant of land at Plattsburg, N. Y., for the location of the school. At the next session the lectures will be given in the Opera House of that city, which is nearly as large as that in New London, Conn., where the sessions were held last year. The winter course was a failure, owing to the lack of scholars. It was not thought expedient to begin it unless at least 500 students were obtained, while only 100 sent in their names, so the scheme was abandoned.

....The Mills meetings at Nashville, Tenn., have continued very successfully, the churches of the different denominations joining heartily in the work. On Wednesday not less than 600 of the leading business houses of the city were closed, and services were held all day, beginning with neighborhood prayer-meetings at 8 A.M. The mass meetings in the tabernacle were packed. One of the features of the meetings was a daily noon prayer-meeting held in the Cumberland Presbyterian Publishing House, in which the various missionary and publication boards of the different denominations shared.

....Under the auspices of the Eisenach Conference, the official convention of the representatives of the various Protestant State Churches in Germany, a new religious census is made in connection with the regular census under control of the Government. The Report for Saxony has just been issued. During the past decade the Protestants of that Kingdom increased from 2,972,805 to 3,500,947; the Catholics from 74,866 to 128,033; the Jews from 6,516 to 9,313; the Dissenters of all kinds from 6,123 to 15,021. The number of dioceses has remained the same, namely 26; the number of parishes has increased from 901 to 971; the towns, villages, etc., in which services are held from 253 to 437; the number of churches from 1,168 to 1,287; the pastors from 1,164 to 1,281. Ten years ago the average number of souls for each pastor was 2,479, now it is 2,605. All around this is regarded as a favorable report for the growth of one of the most pronounced Protestant countries on the globe.

....An interesting incident occurred recently in one of the Metropolitan meetings being conducted by the Rev. C. H. Yatman, in New York City. A letter was read by him asking prayer for a man who said that while on his way to a gambling party he had, attracted by the music, come in the preceding evening and been much impressed. After the reading of the letter, a fine-looking gentleman arose, and saying that he was the man, came forward and, with two others, gave himself to God. He was one of five gamblers converted in these meetings.

....The last annual report of the Hawaiian Evangelical Association, dated January, 1892, gives the statistics of the churches which have grown out of the work of the American Board in those islands. They count 5,427 members of the Hawaiian-speaking churches, with 4,916 in the Sabbath-school; there are also 1,190 members in English, Chinese, Japanese, Portuguese and German churches connected with the Association. The salaries paid to native pastors are small, none of them being over $500. The largest church has a membership of 634. These do not include the mission churches on the Gilbert, Marshall, Ponape, Mortlock and Ruk Islands, connected with its Micronesian mission.

....The Presbytery of Rochester, at a special meeting held February 14th, to consider Revision, after a long discussion, voted to return a general negative, not on the plea of unconstitutionality, but because opposed to the whole movement as inconsistent. An overture was passed as follows:

"*Resolved*, That this Presbytery respectfully and earnestly overtures the next General Assembly for the appointment of another committee to formulate a shorter, more practical and thoroughly scriptural creed that shall express the present faith of our Church."

The Presbytery of Minneapolis adopted the report of its committee answering Overtures I and III in the negative, and accepting the rest. It also overtured the Assembly to ask the presbyteries whether Chapter III, Section 7, shall be omitted from the Confession.

....The well-known Church of the Strangers, of which Dr. Chas. F. Deems is pastor, has decided to move from its old site on Mercer Street and seek a more favorable situation up town. The present site is owned by the Sailors' Snug Harbor Corporation, who leased it for a term of years, of which two and a half still remain. The advance of business has made the location somewhat unsuitable for a church, and the present trustees have decided to seek another location. They hope that enough can be secured from the unexpired lease and the building to assist in erecting a new building. The church will always be associated with the memory of Commodore Cornelius Vanderbilt, who gave the sum of $50,000 to secure the old Mercer St. church for Dr. Deems, in whose work his wife had become very much interested. Dr. Deems, who has been a most successful pastor, is now seventy-two years of age, and has been suffering for several weeks from an attack of paralysis. He is improving in health, however, and the physicians give hope of ultimate recovery.

....The celebrations connected with the jubilee of Pope Leo have continued through the week. Rome is crowded with a throng of visitors from all parts of the world, and the Pope has been busy meeting delegations. In conversation with Cardinal Logue he expressed himself as approving of Irish Home Rule. In his address to the French pilgrims he said:

"I know that France desires to remain Catholic. For this purpose she must be free, Christian institutions must be allowed freedom to develop, and parents must be allowed liberty to have their children educated at Catholic schools. We do not demand the absorption of the civil power by the Church; we merely wish that in France full liberty be given to the people to exercise their religion."

The jubilee presents of money already received by the Pope amounts to 7,000,000 francs. The Austrian Emperor, Austrian Archdukes and Archbishop of Prague and the Primate of Hungary gave 100,000 francs each. The bishops of Austria-Hungary sent 250,000; the nobility of Bohemia, 300,000; Mexican Catholics, 150,000; South American Catholics, 250,000. The Catholic noblemen of Rome gave him a magnificent violet cope in which it was expected that he would celebrate his jubilee mass. The Pope declined to wear the cope, as he believed that on such a solemn occasion he should wear only white. His decision has given such offense to the noblemen who presented the cope that he has promised to wear it at a special mass on St. Joseph's Day.

....At a recent meeting of the Catholic Club of Philadelphia, Cardinal Gibbons emphasized his position on the question of Church and State in a speech from which we quote the following:

"I am firmly persuaded, both by study and observation, that the Church is more sturdy in her growth, and is more prosperous in her career, when she is free to pursue her divine mission without any interference on the part of the State. Here, thank God, the Church is free, and therefore she is prosperous. Here the Church and the State run in parallel lines, each assisting the other, and neither of them unwarrantably intruding on the domain of the other. Here the Constitution holds over the Church its protecting arm without interfering in ecclesiastical affairs.

"We have no State religion or official Church in the United States. But it would be a great mistake to draw as an inference from this fact that therefore our Government is antichristian or anti-religious. I venture to say, on the contrary, that there is no commonwealth under the sun more strongly permeated by Christian and religious principles than the Government of the United States.

"For my part, I believe the relations between the Church and State are as close and cordial as we should desire. All we ask is a fair field and no special favor. I do not wish to see the day when the State will be called on to build our churches and subsidize our clergy. For it were to be feared that, as soon as the Government began to support the Church, it would dictate to us what doctrines we ought to preach. And in proportion as State patronage would increase, the devotion and patronage of the faithful would wax cold. If it is a great wrong to muzzle the press, it would be a great wrong to muzzle the pulpit."

....Mohammed Alexander Russell Webb, who was lately United States Consul at Manila, Philippine Islands, and whose conversion to Islam has been noted already, has arrived in this country and is at present in this city. He claims that the object of his mission is to educate the people of this country in regard to the faith of Islam. He claims there is an astonishing amount of ignorance about this faith, the average American being completely and densely ignorant of the life and teaching of Mohammed; that Washington Irving's "Life of Mahomet" received its inspiration from the Jesuits' library in Madrid; that Sale's translation of the Koran is vitiated by his deep prejudice; that the statements that are fair and just, as those by Thomas Carlyle and Davenport, are usually utterly ignored by the average seeker; that the ordinary traveler or the missionary "cloaks himself in such an air of superiority that he never learns the real truths and beauties of the religion and the marvelous good it has done to the millions of people who have embraced it. They see the seamy side of it, recoil from what they think is the truth, and proceed to decry the faith." Mr. Webb proposes to publish a weekly journal, also to have a publishing house for the issue of Islamic literature, with a free library and reading room attached; thus he hopes in the future to find that Islamic laws can be incorporated into this country, and when these are really introduced into our social system, they will do away with all intemperance and social immorality. The degradation of Mohammedanism in the East he considers to be due not to the religion but to climatic and racial influences and the ancient traditions of those who have become Mohammedans. When asked as to his belief in polygamy, he affirmed that he does believe in it. While recognizing that it would be actually sinful to advocate such a thing in America now, he holds that when the people have been educated to become really moral, polygamy will be a blessing and not a curse. Referring to the report that he had raised large sums of money in India to carry out this mission, Mr. Webb declared that he had not received a single rupee.

Charities.

....Dr. William Gardner, of Bedford, Ind., has made a valuable gift to the American National Red Cross Organization. It consists of a tract of land in the Blue Grass region of Kentucky, covering 782 acres, or considerably more than a square mile, and having upon it a village, a post office, barns, tenant houses, orchards, forests, including groves of sugar maple, quarries of the famous Bedford Oolitic stone, a beautiful river frontage of one mile, and springs of excellent water. A trunk line of railway passes through it, three other lines of railway are near it; making it easily accessible for shipping purposes to all parts of the country. It is three hours from Louisville, four hours from Cincinnati, four hours from Indianapolis, six hours from St. Louis, and seven hours from Chicago. In tendering the gift to Miss Clara Barton, the President of the Association, Dr. Gardner expresses his hope that other persons will join in putting up such buildings as may be necessary to fit it to be the home of the Organization.

....The annual report of the German Hospital and Dispensary Association shows that $60,000 had been subscribed for the purpose of providing a suitable building for a training school for nurses, and that steps would be taken immediately toward carrying out the wishes of the Association. The permanent fund of the hospital has been increased as follows: Legacies, $6,950; donations, $2,296.41; receipts from the concert, $3,779.01; from the German Charity ball, $1,500; and from the Hospital Saturday and Sunday Association, $4,529.57. During the year 2,472 patients were treated in the hospital. In the dispensary 28,232 patients were treated free of charge, 71,584 calls were made upon them, 41 physicians caring for the sick and suffering, dispensing 45,846 prescriptions. The number of applicants varied from 345 to 132 per day. The Charity Organization Society investigated 221 cases.

....The proceeds of the Hebrew Charity Ball, in Philadelphia, January 31st, amounted to $21,523.22. The sum was distributed as follows:

To the United Hebrew Charities	$7,227 45
To the Jewish Hospital Association	5,589 24
To the Jewish Foster Home and Orphan Asylum	5,300 14
To the Orphans' Guardians	1,156 39
To the Hebrew Education Society	900 00
To the Association of Jewish Immigrants	300 00
To the Jewish Maternity Association	750 00
To the Young Women's Union	300 00

....The Thornwell Orphanage, at Clinton, S. C., originally founded by Presbyterians, but gathering from other denominations, has developed from a half-dollar gift of an orphan to a little village of cottages for orphans, with buildings for school work, technical training and general care. There are 120 persons residing in it from ten different States and eight different denominations. Every child is given an excellent business education and is taught a trade. The expense last year was about $10,000, given in small sums by thousands of individuals.

....The annual report of the St. Vincent de Paul Orphan Asylum shows that the receipts for the year amounted to $26,988.44, and the expenditures $26,558.86. The total amount of money subscribed to the Fresh Air Fund was $1,103. By private gifts the asylum received $1,574.26, and by legacies $150. Among those who contributed to the good work of the institution were the policemen of the Twentieth Precinct. They collected over $300 for the Fresh Air Fund.

....The New York Society for the Prevention of Cruelty to Children in its eighteenth annual report gives the following figures for the past year: Complaints received and investigated, 7,994; prosecutions, 3,299; children rescued, 3,726; children sheltered, fed and clothed at the reception rooms, 1,801; cases investigated at the request of the police justices and courts, 2,233.

....Mr. F. F. Thompson, of New York City, has given $5,000 to Williams College toward an infirmary for students. This gift is in addition to that of $2,000 already subscribed for the infirmary. Mr. Thompson's previous gifts include three laboratories, costing nearly $150,000, and an endowment for a winter lecture course.

....The gifts to Harvard College during the past year amounted to $516,000. The sum of $150,000 by an anonymous friend has been announced for a new dormitory, especially for students of small means. More recently it is the recipient of $1,000,000 from the will of the late William F. Wilde, of Brookline, Mass.

....The late Mrs. W. C. Whitney, at the time of the great earthquake at Charleston, S. C., sent a check for $500 to be used in making the Christmas holidays happy for the sufferers. On the occasion of her death the Mayor of the city sent a message to Mr. Whitney calling the kind benefaction to mind.

....The will of the late Josiah M. Fiske, of Newport and New York, contains bequests of $5,000 each to the Hahnemann Homeopathic Hospital of New York, for a free bed; to the Ladies' Christian Union of New York, and to the New York Society for the Relief of the Ruptured and Crippled.

....John R. Rockefeller has recently donated to the Des Moines, Ia., College $25,000 toward making a fund of $65,000 for additional endowment, the whole to be raised by January, 1894. This makes a total of over $40,000 that Mr. Rockefeller has donated to this college.

....At a meeting held recently in a Hebrew Temple in Philadelphia, $30,000 was subscribed to a fund for the erection of model dwellings for the poor.

....A new fellowship has been established in Trinity College, Hartford, by the gift of $10,000 from the estate of H. G. Russell.

Missions.

MISSIONARY QUALIFICATIONS.

BY MRS. CAROLINE L. GOODENOUGH,
Missionary of the American Board.

DURING the past year there has been grave doubt as to whether the work here in Epambela could be continued, owing to the hostility of a heathen chief, whose misrepresentations so influenced the colonial government that the Governor issued an order for the removal of our native preacher from the vicinity. If this order had been carried out, it would have resulted in the breaking up of the work in this neighborhood, which our society began twenty years ago.

While the matter was pending it was made the subject of earnest prayer, with the cheering result that not only has our native preacher not been removed, but the Government has had twenty-five acres of ground surveyed off for the use of our mission, thus giving us a foothold, which hitherto we have lacked. Already a neat stone mission cottage is in process of erection, which will enable the station to have more thorough superintendence from a white missionary than has previously been possible. Our native preacher says: "God (the Great, Great One) has brought all this about."

In order not to exceed the small sum appropriated for the cottage four missionaries worked last week, building the stone walls with their own hands. One missionary had learned in early life to lay stone, and he taught the others. Unskilled natives assisted in quarrying the stone, making mortar, etc. All the missionaries' hands were sore from the unaccustomed toil before the week was over. At the close of one of the long hard days, one of them, a medical missionary who is interested in science, dissected in the evening a rock rabbit, for the purpose of examining its peculiar anatomy, there being curious arrowlike appendages upon its intestines, the object of which is not apparent.

These employments in which the missionaries found themselves temporarily engaged furnish an illustration of a principle which we see exemplified over and over, that there is no useful thing which a man may know which is not found useful upon the mission field. The most diverse abilities and temperaments and every power of mind and body find their place. The power to preach the Gospel with saving effect is above all other gifts, and the man who has it in any marked degree should be relieved as far as possible from the many matters which distract the missionary's attention that he may do "this one thing."

Yet we know useful missionaries who are not eloquent preachers. Among our own associates we see exemplified the usefulness of such varied gifts and acquirements as deep spiritual insight, comprehensive knowledge of the Bible, teaching ability, skill in medicine and nursing, organizing power—both in the line of crusade movements and in the routines of station and school work—power of command, pleasing personal address, linguistic and scholastic ability, business and financial experience, training in kindergarten methods, music—all these are needed—nay, even such secondary gifts as knowledge of building, machinery, housekeeping, gardening, management of domestic animals, skill in photography, in cutting and making garments, fancy work, power of entertainment, good taste; all these find daily scope.

Nor must we forget the power which those missionaries of the second generation possess, whose childhood as missionary children was passed among the people. They have a hold upon the language for which no adult study can

compensate, and they understand the natives to a wink, and enter into their feelings from a different standpoint than the rest of us.

A greater power still the aged missionary possesses, by virtue of his long residence, which no younger worker may share. One of our dear lady teachers requested some time since from the natives, that they would come with their plows and oxen and plow the gardens of the Inanda school. She was overwhelmed the following day when they came with a dozen plows and seventy oxen, and spent the day plowing up a large piece of ground. When she thanked them one native replied: "You need not thank us. You came here when your hair was black and now it is white.' This was his quaint way of expressing his appreciation for the long years of service among them.

While there is no missionary who possesses all these endowments, there is no missionary either who does not possess some of them; and if he has a consecrated heart and the ability to work with others he will be a useful member of the missionary body. Great discrimination is needed in the location of a missionary that the gift that is in him may be put to the best account.

There is one qualification which every missionary must have who is to succeed, and that is self-control—a temper held well in check. The natives watch us closely and read and comment upon our every action. One can scarcely put on one's hat without hearing them say: "Where is the teacher going?" The pleasanter and sunnier we are with the people the better we get on with them. The ability to joke is not to be despised. The missionary who jokes with them over daily affairs can get more from them in the way of services than the one who treats everything seriously. We have not only to preach to them, we have to live among them, and that is the harder part and requires the more grace.

Epambela.

Biblical Research.

IN the *Beweis des Glaubens*, No. 1, 1893, Professor Zöckler discusses the inscription on a pylon of the palace temple Medinet Habu, in which Pharaoh Rameses III in a boastful manner describes his victorious expedition into the southern ports of Palestine. The inscription is a recent find, and on the basis of data furnishes by Professor Sayce, is treated at length in an essay in the *Deutsche Revue*, October, 1892, in an article entitled "Egyptian Accounts of Palestine Half a Century after the Exodus." Geographically the inscription offers interesting materials for study. In the list of districts conquered by the Egyptian King are mentioned those of the River *Yerdana* (Jordan), the Sea *Rethpana* (*i. e.*, Dead Sea, properly perhaps, "Sea of Flames and Sparks," *cf. resheph*, Job 5: 7); the territory of Salem (Jerusalem), as also the cities of Hebron, Kirjath-sepher and others. In the name of the city "Shimshana," Sayce sees a reference to the City of the Sun mentioned in Josh. 19: 41. Zöckler is well enough satisfied with these geographical identifications, but protests against dating the Exodus half a century before these events solely on the basis of the Egyptian records and against the plain statements of the Old Testament. That Rameses II was the Pharaoh of the Oppression, who was followed by Menephta, who was drowned in the Red Sea, is accepted by Sayce in harmony with the views of the majority of the Egyptologists, so that the conquest of the districts around the Dead Sea by Rameses would occur about fifty years later, or just about the time of Joshua. Naturally, if this were the case, it is more than surprising that the Book of Joshua should not contain the least hint of such an important event going out about the same time and at the place with the events recorded in this book or in Judges. But, asks Zöckler, what evidence have we that the Exodus took place between 1281–1260, and not earlier? Why is Rameses II to be regarded as the Pharaoh of the Oppression? Why could it not have been Rameses I, fully one hundred years earlier? Why are the Egyptian monuments and these alone to have the decisive voice against the Old Testament in deciding these chronological facts? The fact of the matter is that *there has absolutely been no convincing reason* discovered in Egyptian sources to identify the Pharaoh of Exodus 1 with Rameses II, and the Pharaoh of the following chapters with his successor. The idea then of an invasion of Southern Judea by the Egyptians at or about the time when Joshua and the Israelites or the Judges were engaged in conquering these districts, is a vision and a phantom. These things are not mentioned in Judges or Joshua simply because they did not occur at that time.

Duhm, in his new Isaiah Commentary, published in the Nowack series, has surpassed all his predecessors in radicalism. He has found not only a Deutero-Isaiah, but also a Trito-Isaiah. To the latter he assigns chapters 61–66, and 56–60, which is the historical order according to him. Duhm also contends that a series of sections in Isaiah are from the Maccabean and the post-Maccabean period. In this respect his views are akin to those of the most advanced French school of Havet and others. It had heretofore been regarded almost as an axiom that at this period the prophetic canon had been closed, and that for this reason the Book of Daniel was assigned to the *Chetubim*. This, however, Duhm denies. Yet it is clear from Daniel 9: 1, *sqq.*, that this book already recognizes a prophetical codex. Duhm, in a noteworthy and original manner, attempts to utilize the meter for the textual criticism of Isaiah.

....At a late meeting of the French Academy of Inscriptions M. Halévy read a paper on two Semitic inscriptions discovered at Zinjerli, in North Syria, recently brought to the Berlin Museum. He says they belong to the ninth and eight centuries B.C., and commemorate two kings of the land of Yadi, who lived a century apart, but both bore the name of Panammu. The second of the name was a vassal of Tiglath-pileser, King of Assyria, who was the first to carry away captives from the ten tribes of Israel. M. Halévy says the language, which has been taken for Aramean, is a Phenician dialect; that is, this tribe of people, generally called Hittites, and who have been supposed to be of an utterly different race and language, and to whom the so-called Hittite hieroglyphic texts are attributed, are, he supposes, proved by these texts to have used a Phenician language and writing.

....The Aristides Apology, so luckily discovered by Prof. J. Rendel Harris, has been widely discussed by Church historians and other scholars in Europe. Dr. Richard Raabe has given a fine German translation from the newly discovered Syriac text, with exegetical and critical annotations, in the Gebhardt-Harnack *Texte und Untersuchungen, Band* IX, *Heft* 1. The Catholic scholar Schönfelder in the *Tübingen Quartalschrift*, 1892, IV, has also given a translation, to be followed by annotations and interpretation. On the age of the fragment Hilgenfeld's *Zeitschrift* has brought new discussions. Egli, of Zürich (1892–'93, I, 99 *ff*), accepts the current date, namely about 154, while Hilgenfeld places it in the age of Hadrian, on the basis of Eusebius, *H.E.* VI, 3.

The Sunday-School.

LESSON FOR MARCH 12TH.

ESTHER BEFORE THE KING.—ESTHER 4: 10-17: 5: 1-3.

GOLDEN TEXT.—Where sin abounded grace did much more abound.—Rom. 5: 20.

NOTES.—This lesson is out of place. Ahasuerus, or Xerxes the Great, lived fifty years before the events in the time of Ezra and Nehemiah. The order of the Persian kings is Cyrus, Cambyses (529–522 B. C.), Darius I (521–485), Xerxes (485–665), Artaxerxes I (Longimanus, 465–424). The marginal dates in the English Bibles are wrong, identifying Ahasuerus with Artaxerxes instead of Xerxes. We have no knowledge when the book of Esther was written, or by whom. We can only say that it was written before the knowledge of the time and conditions of Persia had been lost, by the succession of conquests.——"*Esther.*"—The name comes from that of the Assyrian goddess, Ishtar, or Venus. Her other name, Hadassah, means *myrtle.*——"*Mordecai.*"—Her cousin and guardian before her marriage. These events took place after the return of Xerxes from his disastrous expedition against Greece.——"*Put to death.*"—This severe rule was to protect the king against plots to murder him which might arise in the harem itself.——"*These thirty days.*"—The king had other wives, in plenty, and Esther may not have been his chief wife, tho the story seems to imply it.——"*Think not thou shalt escape.*"—It is true that her relation to Mordecai and the Jews was not known generally, but Haman, Mordecai's enemy, may have known it, or somebody who did know would tell.——"*Fast ye for me.*"—This is one of the hints of religion in the book. The name of God is not mentioned, but fasting implies prayer. The suggestion that she had "come to the kingdom for such a time as this," implies God's providence.——"*Inner court.*"—Where the king on his throne, in the king's house, whose large open front opened on the court, could see any one who approached.

Instruction.—The story of Esther is one of deliverance from danger through human instrumentality and faithfulness. God gives the deliverance, but a woman was the instrument.

We observe that one may think a great deal about God, and depend wholly on him, and yet say very little about him. In the book of Esther the name of God does not once occur. It is constantly repeated in other parts of the Bible, and it is a privilege to speak of God and our duty to him. But there are those who do not like to talk so very much about their religious feelings. There seems to them something very private as well as sacred about their relation to God, and they are not communicative about it. But it may be that they have just as much religion as some that talk more freely. So it was with the writer of the story of Esther. God is in it all, but he is not once mentioned. We have to get by indirection, and by what is hinted or implied, the knowledge of his religion. Yet it is very evident from the fasting and the reference to the providence that raised up Esther that God controlled it all, and no one can read the story without feeling not merely that the Queen was a heroine, but that it was God's deliverance and not Esther's. The feast of Purim is to praise God more than to honor Esther.

God does raise up people for special work. So Washington was raised up, or Abraham Lincoln; so was Moses raised up, or Nehemiah. If a person feels the impulse to do a great and good work, and even more if he has the opportunity come for it, here is evidence that he was raised up to do it. He is greatly guilty if he shrinks from it.

Not the distinguished people alone, who have rank or wealth or great eloquence or learning, are raised up of God for special service, but each one of us has his service set for him. This lesson is about special service; but Christ has more to tell about ordinary service. His parables are full of it. Talents were given to all the servants, to each according to his ability; but each had at least one, which he was to take care of. So all are called to work in the vineyard till the last hour of the day. We must not draw from this story the misleading lesson that God's providence and his special service are for kings and queens, presidents and pastors; but they are for the most ordinary and the youngest. Even in this story not only did Esther have to do her duty, but Mordecai, the gatekeeper, as well, and Hathach, the messenger.

This is a beautiful story of courage. Esther learned her duty, and then she dared death in performing it. How much more would be done if folks were not afraid to do their duty! How much more if they were not too indifferent or lazy!

What a shocking social system Esther lived in and made the best of!

The Jews were persecuted in those days as well as in ours. Don't feel a special prejudice against Jews. Jesus was a Jew. So were Paul and Peter and John. The Jews are still a race to be honored for their history and achievements. They are diligent, thrifty, and quite as moral as any other race.

An act of wrong affects a whole community. Even Esther could not hope to escape when other Jews were killed. If Negroes are lynched by lawless men in Arkansas or Mississippi, it is an injury to the whole country. If a saloon makes ten drunkards, it injures their families and corrupts the whole community. If we let gamblers set up their policy shops or race tracks in New Jersey, they will end by taking possession of the whole Legislature and disgracing the State.

Ministerial Register.

BAPTIST.

APPLEGARTH, REV. H. C., JR., Pittsburg, Penn., called to Cleveland, O.
BOLSTER, A. E., Jackson, Mich., resigns.
BURNS, HERMAN, Hillsdale, Mich., accepts call to Milwaukee, Wis.
CHILD, J. B., Amherst, accepts call to East Brookfield, Mass.
CLEVELAND, G. A., Melrose, Mass., resigns.
DUNCAN, B. F., Momence, accepts call to Utica, Ill.
EVANS, R. P., Kansas City, Kan., resigns.
EVELETH, C. H., Cape Neddick, Me., called to Binghamton, N. Y.
FAIR, MR. GEO. A., Chicago Univ., accepts call to Yakima, Wash.
GATES, L. M., withdraws his resignation at Sterling, Ill.
GREGORY, J. ELY, Pewamo, accepts call to South Baptist ch., Bay City, Mich.
HALE, FRED D., Louisville, accepts call to Owensboro, Ky.
HOLMES, ROBERT, Pittston, Penn., resigns.
HOOKER, J. D., Mt. Vernon, Ill., resigns.
JONES, F. J., East Greenwich, R. I., accepts call to West Springfield, Mass.
JONES, T. G., D.D., Norfolk, Va., resigns.
NORTHRUP, G. S., St. Johns, called to Traverse City, Mich.
NELSON, S. C., Brooklyn N. Y., accepts call to Mt. Holly, N. J.
OWEN, THOMAS, Northmoreland, Penn., resigns.
PURVIS, FRANCIS, North Stonington, Conn., accepts call to North Haven, Me.
PALMER, W. H., Oswego, N. Y., accepts call to Providence, R. I.
THAYER, H. E., Hopkinton, N. H., accepts call to Warren, Me.
WARREN, GEO. F., Saginaw, E. S., accepts call to Bay City, Mich.
WRIGHTNOUR, J. S., Xenia, O., accepts call to Lincoln, Ill.

CONGREGATIONAL.

ADAMS, ALLISON D., Oshkosh, Wis., resigns.
ALLEN, EDWARD P., Sanford, Me., resigns.
ASKIN, JOHN, Kearney, Neb., accepts call to Council Bluff, Ia.
BARNES, HENRY E., Bethany ch., Worcester, Mass., resigns.
BEDFORD, OLIVER C., Nora, Ill., resigns.
BLEASE, WM. H., Williamsfield, O., withdraws resignation.
BRAINERD, F. G., Lake Linden, Mich., accepts call to Parkersburg and Allison, Ia.
BROWER, C. DEWOLF, Dowagiac, accepts call to South Haven, Mich.
BROWN, VICTOR F., Chicago Sem., called to Chapin, Ia.
COGSWELL, JOSEPH S., Standish, Me., resigns.
CRONIN, HENRY C., C. S. S. and P. S., Sup't for Mo., called to Jersey City, N. J.
DEAN, AMOS N., Eagle, Neb., resigns.
EASTMAN, EDWARD, P., Brownfield, called to West Newfield, Me.
EVELAND, SAMUEL, Reinbeck, Ia., accepts call to Third ch., Los Angeles, Cal.
FIELD, FLOYD C., Clare, accepts call to Ewen, Mich.
FLAGG, JAMES W. (Pres.), South Framingham, accepts call to Foxboro, Mass.
FOSTER, ADDISON P., Roxbury, Boston, Mass., resigns.
HILL, GEORGE, Cleveland, O., resigns.
HOLLISTER, FREDERICK M., Wapping, accepts call to Waterbury, Conn.
HURLBUT, W. H., ord., Feb. 26th, Roscommon, Mich.
JENKINS, DAVID T., Hankinson, N. D., accepts call to Buffalo Gap, S. D.
JENKINS, JONATHAN L., Pittsfield, Mass., called to Portland, Me.
JONES, WILLIAM D., St. Louis, called to Aurora, Mo.
LEE, GERALD S., Sharon, Conn., called to West Springfield Mass.
LONG, SAMUEL A., Cooper, accepts call to Clare, Mich.
MARSDEN, B. F., Sioux Falls, accepts call to Valley Springs, S. D.
MOFFAT, THOMAS A,, Detroit, accepts call to Laingsburg, Mich.
OWENS, RICHARD H., Bevier, Mo., resigns.
PATCH, ISAAC P. Oswego Falls, N. Y., resigns.
PINKERTON, W. A., Pres., St. Johnsbury, called to Danby and East Dorset, Vt.
PIERSON, ISAAC, Meriden, Conn., called to Hamilton, N. Y., and also to Brookfield Center, Conn.
PRESTON, ELMER E., Oakland, Ia., accepts call to Hamliton and Breckenridge, Mo.
TATE, WILLIAM J., Windsor Locks, Conn., accepts call to the Union Evangelical ch., Brightwood (Springfield), Mass.
THRALL, J. BRAINERD, First ch., Salt Lake City, Utah, resigns.
VANDER PYL, NICHOLAS, Hartford Sem., called to North Wilbraham, Mass.
WOODRUFF, MRS. EMILY C., ord. Feb. 9th, Little Valley, N. Y.
WRAY, ALFRED K., Central ch., Springfield, Mo., resigns.

PRESBYTERIAN.

BARR, GEORGE W., Fort Morgans, called to Leadville, Col.
BLOSE, D. A., Beardstown, Ill., called to Belmont, N. Y.
BROWN, E. W., inst. February 14th, Malvern, Ia.
DUNCAN, KENNETH J., Seattle, Wash., called to San Francisco, Cal.
FOX, JOHN, Allegheny, Penn., accepts call to Second ch., Brooklyn, N. Y.
HITCHCOCK, WALTER A., Princeton Theo. Sem., called to Charlton, N. Y.
KEARNS, F. A., Butler, accepts call to Sheridanville, Penn.
LONG, JOHN C., Castile, N. Y., resigns.
MACLACHLAN, JOHN, Buffalo, N. Y., resigns.
MAKELY, G. U., Avoca, Penn., accepts call to Brooklyn, N. Y.
NOBLE, W. B, inst. recently, San Rafael, Cal.
NORRIS, JOHN H., Chicago, accepts call to Mount Washington, Ill.
SHERRARD, I. G. Fredonia, Penn., accepts call to Caledonia, N. Y.
THOMPSON, A. B., inst. February 1st., Timnath, Mo.
TURNER, JOHN, Burnside, N. Y,, called to Deerfield, N. J.
WILSON, CALVIN, D., Churchville, Md., called to Franklin, O.

Literature.

The prompt mention in our list of "Books of the Week" will be considered by us as an equivalent to their publishers for all volumes received. The interests of our readers will guide us in the selection of works for further notice.

THE GOVERNOR TALCOTT PAPERS.*

THE value of the Connecticut State papers has always been high. The volume named above achieves the unusual feat of lighting up a dull period with new interest and giving a new support to what the Connecticut historians have always claimed to be the substantial justice of the State treatment of the Indians. The previous number in the series (Vol. III) was destroyed by fire while in press. We hear nothing of its republication and have little knowledge of its contents. The forthcoming Volume V, it is said, will contain wholly new documents, which will throw possibly an unexpected light on some phases of the Indian question, particularly on the controversy over the instruction of the Mohegan Indians and the charges against the Colony on that head made by John Mason to the Home Government in England.

Meantime while waiting for the fuller light promised in this forthcoming volume the documents now edited by Miss Talcott and published in the collection before us are enough to show that neither Connecticut nor Massachusetts was in that condition of insensibility to its obligations to the Indians which has been charged on them. It is very certain, at least, that they were far less insensible to that part of their duty than the majority of people are at the present time to the civilization, education and Christianization of the now surviving tribes, to say nothing of the larger responsibility of Christendom for the heathen world. The volume published by Miss Talcott contains the correspondence between her honored ancestor while he was Governor of the Colony and Col. Adam Winthrop, of Boston, on this subject. We find in these letters evidence that the problem now is not so different from the problem then. It is the old story of a superior race in contact with an inferior and each of them breaking down under the temptation which the condition of things brought to bear on him most powerfully; the white man yielding to his greed and to the opportunity for gain; the red man to his inability to resist the fiery temptation the white man put in his way.

The question, however, is not what the rogues, sharpers and tricksters of the Colony were doing, but what the conscience, character and intelligence of Connecticut society did. On this point these documents are decisive; they show that the colonists have not been credited with as much serious interest in this question nor as much honest determination to do justly by the Indians as they deserve. During the past ten years great progress has been made in our management of Indian affairs; but the perusal of the documents in the collection before us will show that Colonial Connecticut was not far behind our present Indian Bureau.

This volume throws no little light on the growing vexation of the Colony under the trade restrictions imposed on them by Great Britain. It is not wholly fair to condemn outright the British policy in this matter, as some of our writers do, as if it involved some enormous injustice to which the eyes of men were as wide open then as now. By this time we should be too well trained in the equities of such a case to apply to Great Britain the moral and political standards of a much later age. Colonies were then looked on somewhat as branch extensions of the parent house. The paramount interest lay at home. The Colonies were not to venture into competition nor to complain when they were not permitted to drive their trade in competition with the parent house at home. The theory that lay at the bottom of this policy was, after all, the theory of protection to home industry and home interests. But it did not work well when applied to such bold spirits as were managing Connecticut and Massachusetts. For a government that has to deal with a bold and resourceful people it is never safe to adopt a policy which limits them in the use of their rights. The real grievance against Great Britain was this restrictive policy. On the west the Colonies were hedged in against expansion by the north and south line of the treaty of 1754. On the seashore they were met by the trade restrictions which among other impositions forbade the importation of certain articles without their having been first taken into one of two or three English ports, landed and reshipped. British policy did not propose on the one hand to permit the expansion of the colonies into the inaccessible interior, away from the ports or regions easily commanded by their fleets or from the sea. Nor, on the other hand, did it propose to permit colonial competition on certain lines of lucrative maritime trade which were then in the hands of the mother country.

The attempt to carry out this policy broke down first where we should expect it do so, in the maritime States of the North. Massachusetts would not endure it, Rhode Island grew rich on her evasions of it. The discontent became ominous in Connecticut. Governor Talcott was loyal to the Crown, but the mutterings of the coming storm are distinctly heard in his correspondence. We see in these letters the general cause of discontent operating. Discontent had not yet reached that second stage of development where all eyes are fixed on special grievances and where the underlying source of wrong and trouble is commonly overlooked. Loyal as he was Governor Talcott was still loyal in Connecticut fashion and according to Connecticut notions. He was governor of a colony whose proud claim was substantial jurisdiction of its own. It is interesting to note in his letters the innocent astonishment he expresses when called on to submit the action of the Colonial Legislature to the Home Government for review. He pleads the charter which granted without reserve all the rights he claimed. He pleads the precedent which furnished no example of such a review as was proposed. He shows that such review by the Home Government would result in delays that would belate legislation and defeat the ends of law and justice. But after all this adroit and firm front of open resistance he secretly betrays to the confidential agent of the Colony the uncertainty, which always lay near the heart of every patriotic colonial Governor of Massachusetts and Connecticut, whether his whole line of defense might not be upset by one word from the Home Government declaring their charters nothing more than contracts terminable at the will of the Crown.

There is a very curious and adroit letter in this collection from Governor Talcott, which ends with an astute direction to memorize the letter (not copy it) and send it back, frankly intimating that it may be too compromising to be kept in London. The Governor lets out his secret apprehensions, states the independent ground on which the Colonial authorities stand, shows how important it is to gain time, and how the development of the new civil society undisturbed must help them. The public object and political end on which his eye is fixed, perhaps more distinctly than he himself was aware, is the establishment of a real autonomous sovereignty in Connecticut. He does not scruple to consider it an independent government, tho he has not yet come to look at this independence as disloyal to the Crown. Probably he had not thought through the kind of dependence that must result from the conditions, but was absorbed in the present matter of asserting independent self-governing authority for the Colony.

Another point of even greater importance in the development of civil institutions in this country is the account we have in this correspondence of Winthrop's attempt to establish in the Colonies the Common Law principle of primogeniture against the colonial principle of a double portion for the eldest son, and equal division for the other children.

For more than a hundred years Massachusetts and Connecticut had gone on in their own sensible way when John Winthrop, great-grandson of John Winthrop, first Governor of Massachusetts Bay, and grandson of the second John Winthrop, the Governor of Connecticut, on the death of his father, General Wait-Still Winthrop, claimed all his father's landed estate and that of his intestate uncle, Fitz John Winthrop. He brought the claim in court under the English Common law, as elder son, pleading that the colonial charters were conditioned on this law, and could neither change nor abrogate it. He behaved in court with intolerable arrogance. In his petition to the Privy Council, printed in this volume, he describes himself "as the Principall Inhabitant of the Said Collony," and finally escaping from the Sheriff, who had him in too easy custody, fled to England and brought an appeal which, had it prevailed, would have unsettled the land tenures of two colonies. He did succeed in his own case, and it was considered prudent to leave him in the possession of his rights by primogeniture. But Governor Talcott, tho he had himself as a young man been plaintiff in his own behalf in a similar case which went against him in the Connecticut court, had apparently changed his mind, and was now thoroughly awake to the importance of preserving the freer colonial method. He therefore made no attempt to reverse the Crown decision in the Winthrop case, but bent all his efforts to have it treated as an exception, while the law in general should be recognized and confirmed.

In this, after more than twenty years of skillful patience, he succeeded. While the decision was pending the colonists had to settle their estates as they might. Many persons were kept out of their rights. So anxious were the authorities not to provoke the Home Government that not a single case was decided in the colonial courts. Many were, however, settled by private contract, probably as many as could be, or when there were no minor heirs to bar such settlement.

Winthrop never returned to enjoy his primogeniture, but lived and died in England. The case remains the battle ground on which the equal rights of younger children in a family were vindicated and the principle which now prevails in all our States and is asserted in the Federal Constitution won the day for all the future.

This alone gives sufficient importance to the volume before us to draw the attention of students to it; all the more so as the facts appear to be little known. There is not the faintest allusion to the case in the article under Winthrop's name in Appleton's Cyclopædia of American Biography. We understand there is a similar but more wonderful silence about it in Hollister's generally satisfactory History of Connecticut.

This is the last of the three salient points illustrated in this collection which we have room to notice. It by no means exhausts the list. Miss Talcott has done her work well. The index, for example, is a piece of industrious skill and thoroughness which has reduced our labor in examining the volume by more than a half.

* COLLECTIONS OF THE CONNECTICUT HISTORICAL SOCIETY. Volume IV. Published by the Society. Sold by Belknap & Warfield, Hartford, Conn. $3.00.

Manual of Natural Theology. By George Park Fisher, D.D., LL.D., Professor of Ecclesiastical History in Yale. (Charles Scribner's Sons, New York. 75 cents.) A new book from Professor Fisher is always a matter of interest to people who love clear thinking on important subjects. This one is the completion of the similar "Manual of Christian Evidences," by the same author. Both appeal to the same class of readers, readers who do not require more extended treatises. Both stand on much the same ground of merit in the arrangement and treatment of the subject. Mr. Fisher begins with Cicero's derivation of the word religion from *religere* instead of *religare*, as denoting a certain scrupulous habit of life, or in our author's rather free rendering, "a reverential consideration of divine things." In the clean-cut review which follows of the various theories which have been proposed to explain the presence of religious conviction in the human mind we have a striking example of how much, in the way of argument and suggestion, can be done by the simple means of clear and skillful statement. With scholarly precision Mr. Fisher touches all the theories which have been proposed from priestly contrivance and ghostly illusion down to animism. He rejects the theory of primitive revelation and of a distinct religious faculty and accepts the general position which since Lotze, if not longer, has been held to be the most satisfactory, that religious conviction in the human mind is the result of two factors co-operating, man with the radical need and potency of religious belief and action in his original nature, and God immanent in life and Nature, and addressing himself to human reason, conscience and affection. Mr. Fisher believes that nothing would be known of God, not even his existence, were it not for his relation to the human mind, that this is the fruitful source of revelation, and that the revelation would fall dead on man were there not in him original capacities for religious action and religious belief, which come into operation under the moral stimulus of God's revelation of himself in life and Nature. This is presented in the *Manual* before us with extreme brevity, and with a modesty of statement which makes it very easy to miss the great significance of this beautiful and philosophical presentation of a point on which the whole subsequent discussion depends. In the following chapters Mr. Fisher shows himself a sturdy defender of the ground won by the sound thinking of former ages. He does not propose to be frightened by the clamor and clatter of the day from the solid gains made by previous thinkers. He believes, for example, that, tho the cosmical argument and the argument from design may not do all that has been claimed for them, there is a core of truth in them which carries us on toward the final conviction, and is not to be surrendered. He stands up bravely for teleology, and in this happens to have the author of the "Cosmical Philosophy" and Mr. Spencer's special American expositor with him. His remarks on what Kant was aiming at in his slurs on teleology are most judicious, and should not be omitted. We find nothing to comment on in the chapter on the moral argument except that it is marked throughout with Professor Fisher's characteristic neatness and clean-cut precision. In the chapter on the "Intuition of the Infinite and the Absolute" Mr. Fisher asserts that we do know the infinite as real. He says:

> "It [the unconditioned] is the correlate of the finite and relative. It is not a mere idea; it is known as a reality. There is an intuition of a being, neither finite in powers nor related to other beings as a condition of existence. Most philosophers at the present day are in accord in teaching that we have this necessary belief in the unconditioned. This is true of the principal believers of the agnostic schools."

Another interesting point in this portion of the *Manual* is the brief but suggestive paragraph in which it meets what he denominates the "rash and unfounded inference from the circumstance that in the case of man finiteness is connected with personality," that personality must always imply finiteness and cannot therefore be affirmed of the infinite God. The treatment of all these subjects is in the full light of the best modern criticism, but the part of the *Manual* which is specially and *pro forma* addressed to modern speculation is Chapter VI on "Anti-theistic Theories" which with the closing chapter on the "Future Life of the Soul" may safely be left to the reader to draw from them the suggestive riches they undoubtedly contain. The note on the "Ontological Argument" will probably strike most readers as a piece of non-committal civility to an antiquated illusion.

Apologetics; or, Christianity Defensively Stated. By Alexander Balmain Bruce, D.D., Professor of Apologetics and New Testament Exegesis, Free Church College, Glasgow. (Volume III. International Theological Library. Charles Scribner's Sons, New York. $2.50.) Unless we accept the maxim that has sometimes been pleaded, and love him for his faults, we shall have to admit that Professor Bruce, with all his strength and brilliancy, is not always the safest nor most considerate defender of the the faith. He sometimes goes so far under the impulse of a generous and appreciative candor as to surrender ground which is of great importance to the Christian apologist and which, with a little more of the "good dog Holdfast" in his composition, he would not have let go. This is the common defect in the faith of the age, that it is blotted with needless surrenders. We dare say good reasons can be given for them, and we must not complain too much, considering how severe and radical the attack has been and what a splendid defense these modern methods have drawn around the vital facts and sacred treasures of the Christian faith. The present volume is not addressed to rad-

cal unbelievers. It does not go over the preliminary ground of theism, revelation, inspiration, miracles, prophecy and supernaturalism generally. It is addressed to believers who, amid the perplexities which now surround faith, need help, and it is addressed to them as suffering under the confusing and misleading influences of the present times. It is a book which in the last century could not have been written, or, if it had been, would have been useless. The time for it had not come. It is a book which must do its work now. In the next century we hope it will be out of date. The peculiar phase of religious perplexity and embarrassment to which it is addressed having then, let us hope, passed away. The general scheme and scope of the book after a little introductory sketch of the attack of free thought on the Gospel and of the idea and method of defense, especially that to be followed in the present work, the author applies himself to business by going over with his readers in a critical and comparative way the various theories of life and the universe, which have been suggested, Christian and antichristian. This is a fundamental piece of work and splendidly done. When one considers how truly, from a theoretic view of the subject, what we call a religion is simply a working theory of the universe and of life, he will see how quickly and skillfully Professor Bruce begins with his readers in the burning center of the matter. He recites the solid facts they have to deal with. Possibly the first chapter might be improved and wider cogency given to the induction of facts by enlarging the summary. The author appears, however, to have had his reasons for limiting himself to a basis of Christian facts and introducing the others gradually in their place. He next shows how the Christian theory deals with these facts and combines them into the order of a moral cosmos. Over against this in the following chapters we have comparative and critical expositions of the attempts and failures of pantheism, materialism, deism, agnosticism and modern speculation. This completes the First Book. In the Second the author reviews with great freedom "The Historical Preparation for Christianity," as we study it in the Old Testament. The origins of Christianity in the New Testament form the culmination of the whole in the concluding Book III. The discussion under these heads takes a wide range which brings in not only the points at issue between the believer and the unbeliever, but those which at the present time are most vigorously discussed inside the membership of the Church, and which are the source of the greatest perplexity to believers themselves. On all these points Professor Bruce sides, as we should anticipate he would, with the liberals. He is very free in his critical opinions and concessions. Sometimes, we should say, needlessly so. This may, nevertheless, be a better fault than the opposite one. It would seem, however, that without prejudice to his candor a stronger tone might have been adopted in dealing with some of the difficulties of the Synoptical Gospels; almost certainly in his remarks on the Gospel of John, which leave us to regret that he wrote before the new find of the pseudo-Peter was available for his purpose. *Per contra*, his argument on Paul as against F. C. Bauer and the Tubingen *Tendenz* theorists, is bold and strong. It goes straight to the point and drives the nail in to the head. We need hardly add that the practical value of this book entitles it to a place in the first rank. We rate it in the same category as the author's volume on "The Humiliation of Christ," which we have hitherto considered his broadest and most suggestive work. It forms a noble Third Volume in the "International Theological Library."

The first volume of *The New Chambers's Encyclopedia* was published in 1888. The work is now completed in Volume X, which lies before us. During the five years of publication we have steadily used the volumes as they appeared from the press at the rate of about two numbers a year. The good opinion we originally expressed of the work as based upon the numbers then published and on what we knew of the editors, contributors and their plan of revision has been fully confirmed by each succeeding volume. It is an eminently usable cyclopedia. The number of titles is very large. Some computations based on actual count and published in our columns several years ago seemed to show that the number of titles would exceed those in the "Britannica," room having been found for them by rigid economy of space and condensation. The revision has been thoroughly done, and a very large amount of entirely new matter has been introduced. In the distribution of topics American subjects have received a fair recognition. The maps in all the volumes form a prominent and valuable feature of the work. The American maps are not generally equal to the others, for the reason that the cartological surveys on which they are based are lamentably defective. Still the American maps are numerous and as useful as in the circumstances they could be. The more important articles on American topics have been written by American experts. The plan of the work contemplates a practical working dictionary of universal knowledge, intermediate between a collection of exhaustive essays on each subject and mere bare notes. It is not intended to supersede further study, but to treat the topics in outline, giving the information most likely to be required and indicating the sources from which full information can be drawn. The defect of all such English works is in the foreign and particularly the French, German, Italian and generally European department. To a considerable extent this defect has been remedied in this work by its avowed original relation to the *Conversations Lexicon*. Of its class we know nothing to commend with as much confidence.

A Companion to the Iliad for English Readers. By Walter Leaf, Litt.D., formerly Fellow of Trinity College, Cambridge. (Macmillan & Co., New York. $1.60.) This is one of the aids to study which makes one wish himself young again and his school work just beginning. Mr. Leaf is well known by his large edition of the Iliad, with linguistic and grammatical commentary. He was also associated with Mr. Andrew Lang and Mr. Ernest Myers in their well-known prose translation of the Iliad. The *Companion* is not designed for use alone by itself, but in connection with a commentary or, better yet, with such aids as Professor Jebb's "Introduction to Homer," Schliemann's "Excavations," Englemann and Anderson's "Pictorial Atlas to Homer," Miss Clarke's "Familiar Studies in Homer," and Professor Gardner's "New Chapters in Greek History." These books together furnish an introduction to the riches of Homer for which the nowadays student is to be envied. Mr. Leaf's present volume is by no means the least useful or fascinating of the series. The Preface is an admirable piece of work, which reviews the whole subject from the Achaian beginning on, and in the fullest critical light which recent discovery has thrown on it. So far as it can be done in so brief a discussion, the complex question of the Homeric authorship is discussed and left in a position which, if it cannot be positively and dogmatically affirmed to be established, is at least as firmly established as any critical theory of the subject, and moreover, may justly claim to be both intelligible and rational. The notes, which, of course, constitute by far the most important part of the *Companion*, follow the text, but not after the fashion of a commentary, but in a style of large, broad exposition, literary, critical, historical, antiquarian and generally comparative. They throw floods of light on the text, which any inquisitive or enterprising student should delight in. With such aids and "companions" as this and the others mentioned above, the question as to the study of Greek may be safely left to settle itself.

A book to be recommended is Dr. James H. Hyslop's *Elements of Logic*, published by the Scribners. It is intended for the use both of beginners and of more advanced students, altho the subject is not pursued to its most recondite depths. In general, Jevons has been followed, both in matter and in method, and there is no better model. Jevons was not properly a metaphysician, but he had a gift of exposition that made his "Logic" as readable as Whateley's "Rhetoric." Still, with the passage of time it has become possible to add to Jevons's work and to supplement it in places, and this is what Dr. Hyslop has added on his part. The classification of fallacies receives special attention, and no better classroom work can be done than to exercise students upon this subject. There are more useful chapters on "Mathematical and Other Reasoning." "Induction" and "Scientific Method," and in the appendix are lists of problems and exercises.——*Elements of Deductive Logic.* By Noah K. Davis, Ph.D., LL.D., Professor of Moral Philosophy in the University of Virginia (Harper & Brothers, New York. $1.00.) This handbook also appears to have the elements of merit which are required in such a book. It is brief, clearly and systematically arranged on the natural lines of the subject. The definitions are good, and the expositions of the difficulties of the subject are accomplished with enough fullness to be intelligible without confusion. The book is intended to be used in connection with "The Theory of Thought" and the "Elements of Psychology" by the same author.

The last Voyages of the Admiral of the Ocean Sea, as related by Himself and his Companions. By Paul MacKie. (A. C. McClurg & Co., Chicago. $1.75.) Whatever may be said of this book critically, and however it may or may not endure the ordeal of close comparative examination, it has very great interest of its own. It is an honest attempt to construct the story of what the great Admiral was from the accounts which remain to us dictated by himself or by his companions and which relate to the fourteen years succeeding the twelve months covered by the great discovery. The author has drawn the most of his material from Columbus himself and the contributions of his associates as they stand in Navarette and Las Casas. Mr. MacKie has retranslated these selections for his readers from the original. The translated selections form, however, but a small part of his work which, for the most part, is worked up on the basis of the authorities named above and with the intention of presenting Columbus not so much in the character of the discoverer as of the Admiral and Viceroy. This is at least to take the problem at the hardest. To examine critically Mr. MacKie's work would require more space than we can devote to the purpose. Having already called attention to the work as interesting, and one that must command the reader's sympathy, we will only add that we have in these pages by far the most appreciative estimate of Columbus's work on the mainland and of his persistent and obstinate attempt to find a way through to the Indies. Considerable modification of the author's position would be required had he used to the full the light thrown by recent critical inquiry on the subject.

The latest volume in "Heath's English Classics" is *Select Speeches of Daniel Webster*, 1817–1845. This collection is edited with Preface, Introduction and Notes, by A. J. George, A.M., instructor in rhetoric and English Literature in the High School, Newton, Mass. ($1.50.)——The most recent addition to "The Great Educators" Series, edited by Prof. Nicholas Murray Butler, is *Froebel and Education by Self-Activity.* (Charles Scribner's Sons, New York. $1.00.) The author of this volume is Courthope Bowen, M.A, lately lecturer on the Theory of Education at the University of Cambridge, England, and himself a successful teacher. As headmaster of a large London school his attention was drawn to the results of Froebel's methods with the effect of leading him into prolonged observation of the practical operation of the system and its pedagogic outcome. Whatever doubts may still linger in some minds as to the educational value of the method itself, there can be none as to the competence of Mr. Bowen to expound the system nor as to the general soundness of the principle of wisely directed self-help which he declares to be the keynote of Froebel's method.

There are some rather new and striking features in *The Gospel of Matthew in Greek*, edited by Alexander Kerr and Herbert Cushing Tolman, Professors in the University of Wisconsin. (Charles H. Kerr & Co., Chicago. $1.00.) It begins a series in which an attempt will be made to bring out in the text the characteristic individuality of each New Testament author. Words which occur only in Matthew are printed in bold black type. The frequency of occurrence of every word is shown; the *ἅπαξ λεγόμενα* the same; ditto, passages peculiar to Matthew. So also summaries of prominent examples of Hebraism in Matthew, with other similar points of novelty and merit. The text on which the book is based is Westcott and Hort's Tischendorf of 1891, edited by Gebhart, Leipzig.

LITERARY NOTES.

....."A Handbook of Invalid Cooking," by Mary A. Boland, Instructor in Cooking in Johns Hopkins Hospital Training School for Nurses, is to be published by the Century Co.

....The March *Harper's Magazine* has an interesting article on "The Escurial," by the late Theodore Child. The poems of the number are by Mr. W. D. Howells and Mr. Richard Burton.

....The famous *Jahrbücher für Protestantische Theologie*, probably the best known among the German theological journals, has ceased to appear. The new series has closed with the eighteenth volume.

....*Current Literature* has added to its departments of verse and has introduced a single-page illustration of the fashions of the day, in order that the magazine may be more thoroughly a record of the times.

....Arrangements have been made to hold an exhibition in Milan of the humorous and satirical journals of the present and the past. The exhibition will furnish a complete picture of the history of caricature.

....Dr. Carl Priedsch, of London, has undertaken to prepare a catalog of all the manuscripts and old German publications in the British Museum. He proposes to do a similar work for other libraries in England.

....The highly prized unfinished translation of Dante made by Dr. T. W. Parsons, is to be published by Messrs. Houghton, Mifflin & Co. The volume will contain the first two *cantiche* with a large part of the third.

....Charles L. Webster & Co. will publish this spring a volume of "Stories from the Rabbis," by Dr. Abram S. Isaacs, of the University of New York, editor of *The Jewish Messenger*, and a new novel by Miss Matt Crim, entitled "Elizabeth, Christian Scientist."

....In *Harper's Bazar*, February 11th, Colonel Higginson devotes his entire article, a column in length, to a very complimentary review of Mrs. Gertrude Blake Stanton's paper in THE INDEPENDENT of November 21st on "A Winter in a French Convent."

....."Old Rabbit: the Voodoo and other Sorcerers," is the title of a curious collection of stories of Indian and Negro folklore prepared by Miss Owen, with an introduction by Mr. Charles Godfrey Leland which will be issued immediately by Mr. F. Fisher Unwin, of London.

....."Literary Blunders: A Chapter in the History of Human Error," is the title of a volume written by Mr. H. B. Wheatly as one of the "Book Lovers' Library," of which he is the editor. The book will be published by Elliot Stock, of London, and A. C. Armstrong & Son, of New York.

....."Personal Reminiscences, 1840–1890," by the Hon. L. E. Chittenden, Register of the Treasury during President Lincoln's Administration, is announced for early publication by Messrs. Richmond, Croscup & Co., of New York. The book will contain the articles by Mr. Chittenden that are now publishing in THE INDEPENDENT.

....The *Theologischer Jahresbericht*, by all odds the most complete and objective theological annual published, containing a fair *résumé* of the work done in theology throughout Christendom, has passed into the editorial care of Prof. Dr. Holtzman, of Strassburg. It was founded by Dr. B. Pünger, and after his death was edited by the late Prof. R. A. Lipsius.

....The March number of the *Annals* of the American Academy of Political and Social Science will be a special banking and financial number, containing four papers discussing the question of National *vs.* State Banks, with a report of the Seventeenth Session of the Academy, held in Philadelphia, January 12th, at which the banking question was discussed.

....During the year 1892 England published 4,915 new books and 1,339 new editions, or a total of 6,254. Last year the figures were 5,706. The increase has been especially in the department of novels, namely 1,147 as compared with 896 in 1891. Theology reports 528, philosophy 579, medicine 127 new publications, while law has only 26, altho poetry has 185, history 293, and geography 250.

....In a late *Academy*, Mr. William Sharp reviews with much sympathy and appreciative praise "Minutiæ" a volume of poems by Charles William Dalmon, a writer whose occupation, according to the reviewer, is not like that of other "laborer poets" but "is what certain people are wont to call 'menial.'" Mr. Sharp quotes several lyrics which show that whatever Mr Dalmon's daily toil, there is nothing menial about his muse.

....One of the largest, if not the largest, private library in Germany was that of Philipp of Nathusius, the editor of "*Volksblatt für Stadt und Land.*" The whole collection contains 12,800 numbers, and the owner had his treasures in a special building in Neinstadt. Recently the library

has been sold to Kirchhoff & Wigand, of Leipzig, who have published fifteen different catalogs of the various classes of books, which will now be sold.

....A new literary venture of general interest was entered upon with the new year by the well-known firm of Hinrichs, in Leipzig. It is the *Wöchentlicher Verzeigniss der erschienenen und der vorbereitenden Neuigkeiten des deutschen Buchhandels.* It is a weekly of sixteen pages octavo, and under seventeen heads gives all the latest intelligence of new books from the whole German Empire. At the close of each quarter, the preceding issues will appear in permanent form as the *Vierteljahrsregister zur Wöchentlichen Bibliographie.*

....No library in Germany contains such an abundance of Luther and Reformation manuscripts as the collection at Zwickau, in Saxony. New literary finds of prime value are constantly discovered here. Within recent years catalogs of these treasures are being systematically prepared. The latest undertaken is on the nearly four thousand letters from the Reformation era. Two groups of these have been examined, the one covering 222 numbers from 26 different writers, the second, including 275 numbers from 55 writers, all theologians prominent in the days of Luther.

....The Cassell Publishing Co. announce as a timely publication a new edition of Mrs. Helen Mather's "One Summer in Hawaii." "The Making of a Man," by the Rev. Dr. J. W. Lee, which is issued by the same firm, has been received with such special favor by the English-speaking natives of Japan that it is now being translated into Japanese for more general circulation in that country. The Cassells will soon republish, in London, the tale of adventure by the Marquise Clara Lanza and Mr. James Clarence Harvey entitled "Scarabæus: the Story of an African Beetle."

....*The Cosmopolitan* for March contains a paper by Mrs. Henrotin, Vice President of the Women's Branch of the World's Congress Auxiliary, upon the Congresses of the Columbian Exposition; a study of Berlin, by the German novelist, Spielhagen, and it pursues still further the subject of "The Great Railway Systems of the World," dealing in this number with "The Trans-Siberian Railway." *The Cosmopolitan* offers $1,500 in four prizes, in amounts of $1,000, $300 and two of $100 for four water-color paintings, the subjects to be selected from the life of Christ, the treatment calculated for single-page reproduction.

....A new and extremely handsome periodical in a particular line of art, *Musical Notes*, appears from the *Musical Notes* Publishing Company, located at 35 Broadway in this city, in which company a prominent associate was Mr. Walter S. Carter, of Brooklyn, well known for his practical interest in music. The magazine will be monthly; of the nature of a review; and it presents a list of prominent musicians and writers on music as contributors. A special prize of one hundred dollars is offered to American composers for a choral composition as set forth in the magazine's current numbers.

The subscription price is stated at two dollars and a half a year.

BOOKS OF THE WEEK.

Tales from Town Topics, No. 7. The Cousin of the King. By Adrian Schade Van Westrum. 7¼x5, pp. 255. New York: Town Topics Publishing Co. $0 50

Love's Cruel Enigma. (*Cruelle Enigme*). By Paul Bourget. 7¼x5¼, pp. 189. New York and St. Louis: The Waverly Co. .....

Hearts of Oak, A Story of Nelson and the Navy. By Gordon Stables, M.D., C.M. 7¼x5, pp. xvi, 374. Boston: Bradley & Woodruff. .....

A North Country Comedy. By M. Betham-Edwards. 7¼x4¾, pp. 349. Philadelphia, Penn.: J. B. Lippincott Co. 0 50

Keep your Mouth Shut. A Popular Treatise on Mouth-Breathing: Its Causes, Effects, and Treatment. By Fred. A. A. Smith, M.D., C.M., Glas. To which is added an Appendix on Ophthalmia in New-Born Children, by Dr. Smith and Dr. Swan M. Burnett. 7x4½, pp. 73. Boston: Roberts Bros. 0 50

Convent Life of George Sand. (From "*L'Histoire de Ma Vie.*") Translated by Maria Ellery MacKaye. 7x4½, pp. xi, 219. The same. 1 00

In the Bundle of Time. By Arlo Bates. 7x4½, pp. 339. The same. 1 00

The Complete Angler; or, The Contemplative Man's Recreation of Izaak Walton. Edited, with an Introduction, by Edward Gilpin Johnson. 6¾x4¾, pp. xxxiv, 287. Chicago, Ill.: A. C. McClurg & Co. 1 00

Familiar Talks on English Literature. A Manual Embracing the Great Epochs of English Literature from the English Conquest of Britain, 449, to the Death of Walter Scott, 1832. By Abby Ross Richardson. New and Revised Edition. 8x5¾, pp. xiii, 433. The same. 1 50

Plato and Platonism. A Series of Lectures. By Walter Pater. 7¼x5, pp. 256. New York: Macmillan & Co. 1 75

A Roman Singer. By F. Marion Crawford. 7½x5¼, pp. 354. The same. 1 00

The Cosmic Ether and its Problems. By B. B. Lewis. 7¼x5¼, pp. 159. Bridgeport, Conn.: The Evening Post Print. 1 00

An Academic Physiology and Hygiene. By Orestes M. Brand, and Henry C. Van Gieson, A.M., M.D. 7¼x5⅛, pp. xv, 386. Boston and New York: Leach, Shewell & Sanborn. 1 00

The Flower Girl of Paris (*Das Kind der Strasse*). By Paul Schobert. Translated by Laura E. Kendall. 8x5¾, pp. 232. Chicago and New York: Rand, McNally & Co. 0 50

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Financial.

THE NORTHERN PACIFIC.

Northern Pacific furnishes a good illustration of the effect of public opinion upon a corporation where there is the least suspicion of mismanagement. The preferred stock has, within a year and a half, fallen nearly 50%, and within a week over 12%, and the bonds about half as much, on a growing idea on the part of the public that the operations of the company have been dominated most largely by and for the personal interests of those identified with the management. This sentiment began to crystallize at the last annual meeting of the stockholders when an investigating committee was appointed to examine the affairs of the company.

The investigating committee has now reported, and while it finds the physical condition of the property in good shape, it nevertheless criticises very severely the manner in which the Wisconsin Central and certain other properties were turned over to the Northern Pacific at the expense of the latter company and to the enormous profit of the individuals concerned. The committee also reveals the exorbitant rates obtained by certain directors on time loans of money made by them to the company. This committee also argues against the proposition of the management to sell its holdings of St. Paul and Northern Pacific stock in order to pay off the floating debt.

So strongly does the committee express its belief that the property is being and has been mismanaged that it invites stockholders to send to it proxies to oust the present management. This has concentrated the opposition and made it powerful. Opposition not concentrated lacks force.

A leading Wisconsin Central official has sought in a published open letter to cast discredit upon members of the investigating committee without attempting fully to prove false the charges made by the committee. This effort has simply resulted in drawing out from one of the committee an open, personal letter in which the following vigorous language is used:

"If you and the other directors of the Northern Pacific will show the stockholders that you are disposed to work honestly and zealously for their interests there need be no further disturbance; but if you propose answering just criticisms by calling names, if you think you can first plunder stockholders and then abuse them with impunity, it may be necessary to teach you a lesson and to show you that you are not in touch with popular sentiment. As for your proxy which you say you shall not send to the committee we really did not expect it; and we shall not feel greatly disappointed, for when I last saw the stock list you had very little stock, a fact which is creditable to your intelligence. If I had known what you were doing, I too, should have owned but little instead of continuing one of the largest stockholders. In fact, all of your party I believe sold out practically when you saw the effects of your work."

The result of this correspondence has simply served the one purpose of directing greater public attention to the affairs of the company, and, however much on a discussion of the merits of the case, particular operations criticised by the committee may be found to have been in the end for the best interests of the company, the public holds to the belief that they have been dictated more by the personal interests of those concerned than by the future good which may have been in view for the company.

The report of this investigating committee, coming at a time when the Reading road has just passed into the hands of receivers, after the Reading management published a report only a few weeks before, showing that interest had been earned and ordered paid on its income bonds (which the public construed to mean the hight of prosperity) has undoubtedly created greater alarm than would otherwise have been the case.

The public has become thoroughly aroused to the need of honest management of a corporation to insure permanently high and increasing value to its

securities. Hence, the faintest suspicion of dishonesty in any corporation is leading to a discrimination against its securities which cannot help but bring them into great discredit. In fact, so great has the discredit become in the case of Northern Pacific that the company, in order to protect its stockholders against an undue and indiscriminate possible sacrifice of the company's securities now pledged against the company's floating debt, may be compelled, as the Reading Company was, to resort to the courts to stay the hand of justice until such time as the company can prove its ability to do better for the creditors and stockholders than is possible at this time.

Northern Pacific is a great and growing property with an eventful history; but in the construction of it the property has been weighted with a bonded debt, which will require years of development to be properly taken care of and leave a surplus of any consequence for the stocks.

Under these circumstances there is needed above everything else such a conservative management at this time as shall give great stability to the prices for its securities and increase the credit of the company so that as new extensions and improvements are needed, it can secure money on reasonable terms.

It must not be forgotten that to push the property to the position it now occupies, as a great transcontinental road with extensive terminals at Chicago as well as on the Pacific Coast, required men of just the sanguine temperament possessed by Mr. Villard. It takes a bold, sanguine man to push any enterprise into great prominence and usefulness; but there are times when these men must be kept in the background to give place to more conservative people, whose main efforts will be simply to take care of what has been thus boldly launched.

Such a period has been reached in the case of Northern Pacific. It is admitted by its best friends to have reached the point where it needs above everything else at this time the guiding hand of a strong conservative management, which will seek only to develop the business of the road to its present fullest capacity.

In such a management the public would have full confidence at this time, and for such a management the public is waiting, and upon the course of such a management will depend the future of Northern Pacific.

FINANCIAL AND COMMERCIAL.

FOREIGN trade returns are very discouraging, imports showing large gains, and exports immense losses. The January returns were as follows:

	Exports.	Imports.	Differences.
1893.....	$67,660,000	$83,775,000	—$16,115,000
1892.....	100,138,000	62,719,000	+ 37,419,000

This statement shows that, while in January a year ago our exports were $37,419,000 in *excess* of imports; in January of the present year they fell $16,115,000 *below* imports This accounts largely for the net export of $12,219,000 gold during the month; altho the foreign disposition to hoard gold, and the distrust about financial legislation at Washington, undoubtedly accelerated this movement. The question what has caused this sudden shifting of trade balances is not easy to answer. The fact that exports a year ago were abnormally large is not sufficient explanation, because exports are still much below the ordinary volume at this period. For instance, exports in January, 1891, were $82,629,000, or nearly 15,000,000 larger than last month. Of the decrease in exports nearly $18,000,000 was in breadstuffs, $9,000,000 in cotton, and about $1,700,000 in provisions.

Great depression abroad, together with better crops in Europe have, of course, materially checked our exports. Speculation here, in products that would have been impossible but for silver inflation, has also seriously diminished exports. At the same time large prosperity in the United States naturally made this a good market for foreign products; and foreign manufacturers quietly turned their attention to the United States when trade at home was bad; the result being we have bought heavily and sold sparingly. In some manner we must pay up: and as Europe doesn't seem to want our securities, she has used her power of choice and exacted gold.

It needs no alarmist to picture the gravity of the financial situation just now. With a probable continuance of unfavorable trade balances; with the Treasury free gold below $4,000,000 at the close of the week (including the $8,000,000 advanced by New York banks); with a drop during the week in bank reserves of $4,200,000; with distrust spreading from developments in the coal, sugar, whisky, cordage and railroad combinations; and with Europe still inclined to return our investments, the situation is surely serious enough to attract attention to the crisis threatened, unless Congress or the Administration quickly does something to remove the silver danger. There are some very important ifs to be faced just now; and the longer they are contemplated the worse they grow.

General business is contending against many adverse conditions. The severity of the weather, uncertainties about monetary and tariff matters, as well as demoralization in the stock market, all served to induce caution and to limit the demand for merchandise to hand-to-mouth requirements. Nevertheless, trade is by no means in an unsatisfactory or unsound state; and any improvement in above conditions would probably meet with quick response in business circles. Preparations for spring trade are necessarily backward, tho the cold winter has had its advantages in largely increasing the consumption of coal, warm clothing, shoes, rubber goods, etc. Attention is already being turned to crop prospects; and, fortunately, winter wheat has escaped with little injury. As country roads improve, floods subside and transportation resumes its natural channels, a better state of affairs in business may be anticipated. Thus far, confidence in business circles has not been so greatly disturbed by the rush of untoward events as in Wall Street.

While speculation outside of the Stock Exchange is restricted, the volume of legitimate trade continues large; and the repeated failures to bring up the Anti-Option bill in Congress have exerted a beneficial effect. Breadstuffs, however, were dull, and wheat was practically unchanged, February contracts remaining about 77⅛c. Corn was equally dull at about 52c. for February. Exports of wheat for the week were only 1,000,000 bushels against 1,800,000 same week last year; the exports of corn for the same periods being 779,000 and 4,023,000 bushels respectively. Europe seems wholly indifferent to our grain markets for the present. Meanwhile, we have a visible supply of wheat of 80,216,000 bushels, nearly double last year's; and a visible supply of corn amounting to 14,700,000 bushels against 10,000,000 same time 1892.

Cotton advanced ⅛c. under the impression that the Anti-Option measure would fail, and the settlement of labor difficulties in Lancashire also strengthened values. Middling uplands are quoted at 9¼c. Exports since September 1st have been 12,811,000 bales below last year; but receipts are 1,782,000 bales short, and visible supply 500,000 bales less than a year ago; nevertheless, the visible supply is 1,304,000 bales larger than in 1890. Speculation in pork products halted, too much manipulation and high prices having checked demand. Pork is quoted at $19.50 for old mess, and lard declined to 12.37c. for prime city. Receipts of hogs are now increasing in contrast with previous continuous shrinkage; and this, also, was a factor of weakness. The season's packing closed on the twenty-eighth of February, and showed a total of about 5,000,000 hogs, a decrease of about 3,000,000 compared with last year. Western cattle markets have been active, and receipts at Chicago are reported at 434,000 head this year compared with 399,000 same period last year. Coffee was dull and weak under large supplies. Rio No. 7 being quoted at 17⅛c. Groceries generally are dull, tho sugar moved rather more freely at slight concessions, granulated selling at 4 13-16c. Tin advanced to 20.30c., for straits, owing to favorable cables. A slow demand for copper induced shading down of prices to 11.95c. for Lake. Foreign advices and small demand depressed lead slightly to 3.95c. Even the iron markets were disposed to weakness, No. 1 X selling at $14.50, and business in steel rails and structural sorts being of very limited proportions.

A very satisfactory state of affairs continues in the textile trades; leading cotton, woolen and silk mills still being largely sold ahead of production. But the volume of new orders received is limited, and, were it not for the activity in deliveries the feeling would not be so good. Prices are well maintained at recent advances in woolens, cottons and silks; and preparations for spring trade are well under way. Among jobbers trade has hardly equaled expectations because of unfavorable weather.

Wall Street suffered a pretty severe shaking up. What with the heavy losses in Reading, New England, sugar, whisky, cordage, etc., it is surprising that the week closed without any failures. Fortunately the brunt of these losses fell upon a few professional operators. Outsiders and bankers escaped comparatively free. Of course, interest centered chiefly upon Reading and New England. Much indignation is expressed over Mr. McLeod's administration of Reading, particularly his financial methods, and strong efforts are being made to oust him from the receivership. The real status of Reading has become as much of a mystery as ever; hence the air is full of all sorts of reorganization and assessment stories. Nobody, however, questions the impropriety of making Receiver the manager who has brought the company into present difficulties by paying interest with borrowed money, and attempting dazzling combinations, all apparently in the interest of a gigantic speculation. Another mystery is the future of New England. While the bearish feeling was at its hight, Northern Pacific came in for an unwelcome attack. The physical condition of the property is considered good and its business present and prospective satisfactory; but the criticisms directed against the financial management of the company were effectively used against the stock. Naturally enough the industrials came in for a share of the general weakness, and within a short period cordage, whisky and sugar have all broken several points. The banks continue to discriminate sharply against these, and not a few brokers decline to handle them except upon ample margins. Investors, too, continue shy of them; because present values are based upon monopoly profits which cannot be long maintained. Were these branches of business better conducted and profits scaled down to what could be maintained in face of open competition, or even kept low enough to discourage new competition, they would undoubtedly quickly enlist public favor; for investors are rapidly learning to place their funds on other than railroad, Government and State securities. A good deal of uneasiness exists over the monetary situation, and hopes are entertained that President-elect Cleveland will call an extra session to act upon silver. The "street" is now more sensitive upon this point than at any time, and, tho other sources of disturbance remain, yet right action on part of the Government would do more toward restoring confidence at home or abroad than any other single circumstance. Europe has been a steady purchaser of our gold-bearing securities for some time past; but otherwise they are being returned to us. Money was active and firmer. Call loans on stocks ranged 3@12%, 5% being a fair average rate. For time money the demand was good; but banks were not disposed to lend freely, 6% being the usual rate for all dates. Commercial paper is dull, prime double names being quoted at 5½@6% for 60-days and four months. Demand for currency from the interior is increasing.

The following is a comparison of the averages of the New York banks for the last two weeks:

	Feb. 25.	Feb. 18.	Decrease
Loans.....	$458,570,900	$462,518,600	$3,947,700
Specie.....	72,959,000	75,700,300	2,741,300
Legal tenders...	54,602,800	58,808,900	4,206,100
Deposits.....	472,708,100	483,613,200	10,905,100
Circulation.....	5,572,200	5,518,500	*53,700

*Increase.

The following shows the relation between the reserve and the liabilities:

Specie	$72,959,000	$75,700,300	$2,741,300
Legal tenders....	54,602,800	58,808,900	4,206,100
Total reserve..	$127,561,800	$134,509,200	$6,947,400
Reserve required against dep'ts.	118,177,025	120,903,300	2,726,275
Excess of reserve above legal requirements.....	9,384,775	13,605,900	4,221,125
Excess of reserve, Feb. 27th, 1892.....			$26,959,700

GOVERNMENT BONDS.

	Bid.	Asked.
U. S. 4s, 1907, registered.....	112¼	113¼
U. S. 4s, 1907, coupon.....	112¼	113¼
Ext. U. S. 3r, 1891, registered.....	99¼	...
Currency 6s 1856.....	105	...
Currency 6s, 1896.....	107½	...
Currency 6s, 1897.....	110	...
Currency 6s, 1898	112	...
Currency 6s, 1899.....	114¼	...

FOREIGN EXCHANGE.

The market for sterling was strong but dull.

Messrs. Baring, Magoun & Co., posted rates as follows:

	60-days.	3-days
London.....	4.87	4.89¼
Paris—Francs.....	5.16¾	5.14⅜
Geneva.....	5.15⅝	5.13⅝
Berlin—Reichsmarks.....	95⅝	95⅞
Amsterdam—Guilders.....	40¾	40¾

CITY BANK STOCKS.

The quotations at the Board for city bank stocks were as follows:

	Bid.		Bid
America.....	217	Irving.....	160
Am. Exchange.....	156	Manhattan.....	190
Broadway.....	260	Market & Fulton.....	250
Butchers' & Drovers'.	184	Mechanics'.....	190
Central National.....	137	Mercantile.....	220
Chase National.....	450	Metropolitan.....	5
Chatham.....	410	Mount Morris.....	325
Chemical.....	1400	Nassau.....	170
City.....	450	N. Y. County.....	630
Citizens'.....	156	N. Y. National Ex....	130
Columbia.....	275	Ninth National.....	126
Commerce.....	192	Nineteenth Ward....	190
Continental.....	131	North America.....	168
Corn Exchange.....	255	Oriental.....	295
Deposit.....	114	Pacific.....	190
East River.....	150	Park.....	310
Eleventh Ward.....	200	People's.....	290
Fifth Avenue.....	2000	Phenix.....	125
First National.....	2500	Republic.....	172
First Nat'l of S.I....	117	Seaboard National...	175
Fourteenth St.....	175	Second National.....	325
Fourth Nat'l.....	200	Seventh National....	130
Gallatin National....	310	Shoe & Leather.....	157
Garfield Nat'l.....	400	St. Nicholas.....	130
German Am.....	133	Southern National...	110¼
Germania.....	330	State of N. Y.....	114
Greenwich.....	150	Third National.....	112
Hanover.....	355	Tradesmen's.....	111
Hudson River.....	156	United States Nat'l..	710
Importers' & Traders'	600	Western Nat'l.....	115

BANK STOCKS.

Sales of bank stocks for the week ending February 25th, were as follows:

Commerce.....	192	Mechanics'.....	190
Eleventh Ward.....	300	Mercantile.....	227
Madison Square	151	Park.....	316¼

INACTIVE INDUSTRIAL SECURITIES.

	Bid.	Asked.	Last Sales.
H. B. Claflin Company, 1st pfd....	100	..	100
do. do. 2d pfd.....	..	..	101
Thurber-Whyland Co. com.....	..	..	50
do. do. pfd.....	..	..	98
Trow Directory, com non.....	..	..	..
do do preferred.....	..	..	81
Proctor & Gamble com	107	..	..
do. do. pfd.....	114	..	115
P. Lorillard Co. com.....	..	..	..
do. do. pfd.....	120	121	120
Blackwell's Dur. Tob. Co. com....	15¾	15⅞	11
American Straw Board Co.....	88	90	89¼
Celluloid Co.....	95	96	95¼
New York Biscuit Co.....	56	59	58
Diamond Match Co.....	160	162	161
Eppens, Smith & Wiemann Co....	116	119	116

FINANCIAL ITEMS.

....Charles Parsons has resigned as President of the New York and New England Railway Company.

....The well-known banking house of Messrs. E. H. Rollins and Sons offer for sale a limited number of the first mortgage, five per cent. bonds of the Brooklyn City and Newtown Railroad, particulars regarding which will be given on application.

....The statement of approximated gross earnings, all lines, of the Atchison, Topeka and Santa Fé Railroad Company, for the second week of February, and month to date, compared with same, previous year, shows an increase for the week of $61,962.30, and month to date, $106,996.80.

....The death last week of Allen Manvel, President of the Atchison, Topeka and Santa Fé Railway, will be a very great loss to that Company. Mr. Manvel was a practical railroad man of very great experience, and was the possessor of tremendous energy, which latter quality probably caused his decease. There is some talk that it would be in the interest of the road were J. W. Rinehart promoted to the presidency.

....Stephen C. Broadwell, one of the most expert forgers and counterfeiters, was arrested in this city last week, and fully identified by persons whom he had defrauded in Cincinnati. His method was to purchase drafts for small amounts and raise them to large ones, which he did so skillfully that the change could not be detected under a magnifying glass. It is quite likely that his operations will cease for a time.

....According to Mr. Leech, the Director of the Mint, the production of the precious metals for the calendar year 1892, was from the gold mines of the United States, $33,000,000. The product of silver was 58,000,000 ounces, valued at $50,750,000. The Government bought during the year 54,129,725 fine ounces, costing $47,394,291. The export of gold from the port of New York from February 19th, 1892, to February 15th, 1893, aggregated $90,728,839. The stock of gold in the United States fell off during the last calendar year $39,000,000, while the stock of silver increased $46,000,000.

....The Legislature of the State of New Jersey, for 1893, will probably be spoken of in history as being not only one of the most corrupt but as one of the most remarkable in many other ways of any Legislature ever convened in any State. One of the very latest idiosyncrasies of this New Jersey Legislature is the introduction in the Senate of a bill which provides that a man cannot leave to members of his family at his death more than $1,000,000, and that any amount over that sum must revert to the State. This is slightly communistic; but such a little matter as that does not trouble the New Jersey Legislature.

....On the eighth of March the building occupied for many years by the *Mail and Express*, at 23 Park Row, is advertised to be sold at auction. There is much historical interest attached to this property. At the time of the Revolution it was known as the

Vineyard and was part of a pr perty belonging to John White. Mr. White was a Tory, and his property was confiscated by the Government. His wife purchased the property from the Commissioners in Forfeiture, June 30th, 1784, for 3,500 pounds, but this also included the two adjoining lots. John Jacob Astor was in 1806 a part owner of the property, and his interest was held by his heirs as late as 1850 when it was conveyed by them to a Mr. Finlay who sold the property to Isaac N. and John J. Phelps, the latter the father of William Walter Phelps our present Minister to Germany.

....Mr. Arthur Leary died on Wednesday last at his home in this city at the age of sixty-three. Mr. Leary has been prominent in New York business and social circles for many years. At his death he was the sole survivor of the original board of directors of the National Park Bank of which about twenty years ago he was elected vice president and has held the office ever since, but only during the past two years has he been in attendance in the discharge of his duties. He was within the past year elected President of the New York Mutual Gas Light Company. He was a director of the Illinois Central Railroad Company, the New York Mutual Marine Insurance Company, the Pacific Mail Steamship Company, the Manhattan Life Insurance Company, the Emigrants' Saving Bank, and the Third Avenue Railway Company. For a great many years Mr. Leary was engaged in the shipping business in this city and secured a large property.

....There have been some recent changes in the management of the Manhattan Trust Company of this city. J. I. Waterbury, formerly Vice President, has been made President. Mr. Waterbury is well known in financial circles, and in his hands the affairs of the Manhattan Trust Company are sure to be well managed. The new Vice President is John Kean, Jr. Mr. Kean was the Republican candidate for Governor of New Jersey last fall, and is a well-known citizen of New Jersey. The Second Vice President is Amos T. French. The Board of Directors includes August Belmont, C. C. Baldwin, Richard T. Wilson, Henry W. Cannon, President of the Chase National Bank; E. D. Randolph, President of the Continental National Bank; Thomas Jefferson Coolidge, Jr., and H. L. Higginson, of Boston; Samuel R. Shipley, President of the Provident Life and Trust Company of Philadelphia; and other well-known men. The capital of the Manhattan Trust Company is one million dollars.

....Among the securities sold at auction were the following lots:

1 membership N. Y. Produce Exchange	$610
32 shares Thurber-Whyland Co., pref	99@101
30 shares Thurber-Whyland Co., com	50@51
2 shares Second Ave. Rd. Co.	167½
10 shares R. E. L. and T. Co.	150
100 shares State Trust Co.	275
25 shares Herring-Hall-Marvin Co., com	75
$1,000 C. B. and Q. Rd. Co. (Neb. Extension) 4% mort. sinking fund bond, due 1927	87⅞
$1,500 T., A. A. and N. M. Ry. cons. first mort. 6% gold bonds, due 1924	105⅝
$2,000 M. and St. P. Ry. Co. (C. and M. Div.) first mort. 7% bonds, due 1903	124½
$3,000 O. and M. Ry. Co. cons. mort. 7% bonds, due 1898	110¾
$1,000 M. and E. Rd. Co. first mort. 7% bond, due 1914	136½
18 shares Manhattan Ry. Co.	157⅝
$1,500 Dry Dock, East B'way and Battery Rd. Co. 5% cer. of ind.	90½
$530 Atlantic Mutual Ins. Co. scrip of 1889	101
$23,000 Chateaugay Ore and Iron Co. 6% mort. bonds, due 1915	85
50 shares Westchester Fire Ins. Co. ($10 each)	170
20 shares Third Avenue Rd. Co.	250
46 shares N. Y. and N. J. Telephone Co.	94¼

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Dealers in Investment Securities,

BUY AND SELL ON COMMISSION FOR CASH OR ON MARGIN ALL SECURITIES LISTED AT NEW YORK STOCK EXCHANGE.

DEPOSITS RECEIVED AND INTEREST ALLOWED ON BALANCES SUBJECT TO DRAFT AT SIGHT.

Peabody, Houghteling & Co.

INVESTMENT BANKERS.

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CHOICE FIRST MORTGAGE LOANS

On Chicago Real Estate in any amount always on sale. Principal and interest payable IN GOLD.

HAVE YOU ANY INTEREST

either in farm or city mortgages upon real estate in Minnesota and North and South Dakota? Have you any trouble with titles, non-payment of taxes, etc.? Do you wish prompt, reliable legal advice or attention in any way? Highest references given. Correspondence desired. TAYLOR & WOODARD, 904 Guaranty Loan Building, Minneapolis, Minn.

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Six per cent. interest paid on time deposits. Investments made for customers. Correspondence solicited. Correspondent: Chase Nat. Bank, New York, N. Y.

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Send your address on a postal card for "Duluth Annual Record," and read the progress of a growing city M. L. McMINN, Real Estate Broker, Duluth, Minn.

WE OFFER, SUBJECT TO SALE,

$100,000

Brooklyn City & Newtown R.R.

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First Mtge 5% Bonds.

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PRICE ON APPLICATION.

Send for special circular, also circular describing high-grade municipal bonds.

E. H. ROLLINS & SONS,

33 WALL STREET, NEW YORK.

The Debentures of this corporation are a good safe six per cent. investment.

New England Loan & Trust Co.,

160 Broadway, N. Y.

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161 LaSalle Street, Chicago.

Your Idle Money Will Earn Large Returns If Sent to Us.

We issue Trust Certificates guaranteed by assets amounting to more than $2.0 in assets for every $1.00 in certificates. On these certificates we pay 6 per cent. per annum, payable semi-annually. The certificates are issued for terms of 3, 5, 8, or 12 years, as investors may elect. The interest is paid semi-annually during the term for which the subscription is made, and at the end of the term the principal sum, together with its PRO RATA share of one half of the profits, is returned on the surrender of the certificates.

Address WALTER THOMAS MILLS,
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161 LaSalle St., Chicago.

IOWA LOAN & TRUST CO.,

DES MOINES, IOWA.

Capital,	$500,000 00
Surplus and Undivided Earnings,	266,423 24

INCORPORATED 1872.

Under supervision of Banking Departments of New York, Massachusetts, Connecticut, Vermont and Maine.

Offers to investors at par its 5½ per cent. Debentures, amply secured by first mortgages on real estate held in trust; principal and interest payable at the Chemical National Bank, New York.

Write for pamphlet giving full description.

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10% NET FIRST MORTGAGE LOANS. Absolutely secure. Interest payable semi-annually by draft on New York. Personal attention given to all loans. Highest references. Address FRANK J. HAMILTON, Fairhaven, Wash.

8% NET obtained on first mortgages. Real estate security. Send for maps, photographs, circulars, etc. References furnished. E. R. BRACE, INVESTMENTS, DULUTH, MINN.

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INVESTMENTS In REAL ESTATE carefully made.

LOANS negotiated, secured by first lien on Real Estate, without expense to lender.

Correspondence invited.

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MORTGAGE BANKERS,

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6 Per Cent. Mortgages on Improved Chicago Property For Sale at par and accrued interest. Securities worth double the amount loaned thereon. Correspondence solicited.

TACOMA Realty. Choice investments made for non-residents; 25 to 100 per cent. can be realized within next year. Lots from $100 and acreage from $10 upwards. Improved property rented now for 10 per cent. besides the increase in city and country properties. Ranches, garden, fruit, hop, farm, iron and coal lands, mining properties. Write E. V. Russell & Co., Tacoma, Wash.

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7 PER CENT. Interest guaranteed. First mortgage Portland Real Estate securities.

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Investments made for non-residence. Correspondence solicited. JAMES E. DAVIS & CO., No. 201 1-2 Morrison St., Portland, Oregon.

New York Guaranty & Indemnity Co.,

59 CEDAR STREET, NEW YORK.
Mutual Life Building.

CAPITAL, -	$2,000,000
SURPLUS, -	1,000,000

In addition to its special charter privileges, this Company possesses all the powers of Trust Companies under the New York Banking Laws; acts as Trustee for Corporations, firms and individuals, as Executor or Administrator of estates, and is a legal depository of trust funds.

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Full information can be obtained from the Los Angeles Safe Deposit and Trust Co., and the Citizens' Bank, Los Angeles; and from all the Banks in Pasadena, viz.: First National Bank, Pasadena National Bank and San Gabriel Valley Bank. For Prospectus and other information, address the

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Reliable, Conservative.

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Very highest reference given.

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Capital	$2,000,000
Surplus	3,000,000

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FAIRHAVEN,

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United States Mortgage Co.

Chartered 1871.

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This Company has all Trust Powers granted by the Banking Laws of the State of New York, together with special charter privileges. Loans Money on Bond and Mortgage, Issues Debenture Bonds, Receives Deposits subject to check and allows interest on daily balances, Issues Certificates of Deposit, Acts as Trustee, Registrar, Transfer Agent, Pays Coupons, Executes all Trusts.

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CHICAGO FIRST MORTGAGE LOANS.

Only 20 to 40 per cent. of value loaned on selected inside improved property; sums of $500 to $5,000 ready for delivery, to net investor 6 to 7 per cent. Loans registered by Northern Trust Company (Bank) Trustee. Payable in Gold Coin. Choicest securities in market.

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Fourteen Years' Experience.

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San Antonio, Texas: Lockwood National Bank; San Antonio National Bank.
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Opened for business September 14th, 1891. A 3 per cent. dividend declared July 1st, 1892.

Is increasing its capital to. $500,000
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Offers a portion of the increase to investors at $102 per share—book value.

Ample use can be found to profitably employ the additional capital at 10 per cent. per annum, in discounting good commercial paper.

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is when property is low. Write me for facts about Real Estate.

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Offer exceptionally safe, choice, Western investments. Write for lists, etc., mentioning INDEPENDENT.

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We offer Convertible Debentures, yielding 8 per cent. on the investment, and issued by an old-established Company earning on the average for the last five years four times this interest charge.

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7% to 8% Net.

Gold mortgages secured by Tacoma inside improved property. Policy of Title Insurance. Eastern and Pacific Coast references. Correspondence solicited.
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READING NOTICES.

TO OUR READERS.

REMOVAL.

THE INDEPENDENT has removed to permanent quarters in the Fulton Building, 130 Fulton Street, corner Fulton and Nassau Streets. It will occupy the entire eighth floor, which has been fitted up expressly for its use. Two fast-running elevators are in continual operation.

The issue of THE INDEPENDENT this week gives us great satisfaction, and we have no doubt our readers will fully appreciate it.

Attention is called to our Club Rates given below, by which a subscriber can, if he desires, secure a reduction in the cost of his paper. A large proportion of our subscribers take advantage of our Club Rates by renewing for two years, paying five dollars, or for five years, paying ten dollars, or by sending the names of other subscribers with their renewals.

TERMS OF SUBSCRIPTION.

One Month	$ 25	Six months	$1 50
Three months	75	Nine Months	2 25
Four months	1 00	One year	3 00

CLUB RATES.

Two years to one subscriber	5 00
One year each to two subscribers	5 00
Three years to one subscriber	7 00
Three subscribers one year each	7 00
Four years to one subscriber	8 50
Four subscribers one year each	8 56
Five years to one subscriber	10 00
Five subscribers one year each	10 00

In clubs of Five or More, $2.00 each. Single Copies 10 cents.

"TRIAL TRIP" one month, 25 cents.

THE INDEPENDENT is not sent to subscribers after their paid time has expired. We will, however, take pleasure in continuing the paper to any subscriber who does not find it convenient to remit at the expiration of his subscription, upon receiving a request to that effect.

Our Clubbing List with other papers and magazines for 1898 is now ready, and will be sent to any one asking for it.

We can supply individuals, reading clubs, colleges, etc. with their entire reading outfit at reduced rates.

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A BEAUTIFUL winter resort for invalids has been opened at Lakewood, New York.

MAKE THE CHURCHES CHEERFUL.

THERE is nothing that adds more to the popularity and prosperity of a church than cheerfulness, and there is nothing more conducive to cheerfulness than a good light. With the improved methods now in vogue there is no reason why every church should not be as bright by night as by day, with but very little cost. The best aid to the economical lighting of churches, halls and large rooms is the "Bailey Reflector." This ingenious device is so constructed that it diffuses light into the farthest corners of a church, and makes the fine t print readable. All ministers, or those interested, should write to the manufacturers for catalogue and price list. Their address is Bailey Reflector Co., 708 Penn Ave., Pittsburgh, Pa.

SPRING HATS.

THE well-known firm of Messrs. Robert Dunlap & Company have just put on sale their spring styles of gentlemen's silk and felt hats. There are thousands of churches throughout the country who will buy no other hat than Dunlap's, and they await the spring and fall styles before making their purchases. Dunlap's hats this spring are more attractive than ever, and are meeting with a large sale.

ELECTRICAL SUPPLIES.

MANY of our readers will be pleased to know of a responsible firm from whom they can obtain electrical supplies of all kinds, and it therefore gives us pleasure to call their attention to Messrs. E. S. Greeley & Co., of 5 and 7 Dey Street, New York, large manufacturers and importers of everything in that line.

Arnold, Constable & Co

LYONS

SILK AND WOOL FABRICS

Armure Sillage,

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OMBRÉ FLAMÉ,

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White Veloutine and Cristal

for Wedding Gowns.

LIGHT COLORINGS

for House and Evening Wear.

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EUROPE, HOLY LAND, WORLD'S FAIR.—Select parties; best ticketing facilities; choicest ocean berths. Send for "Tourist Gazette." H. GAZE & SONS, 113 Broadway, N. Y. (Est. 1844.

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A GREAT CORSET HOUSE.

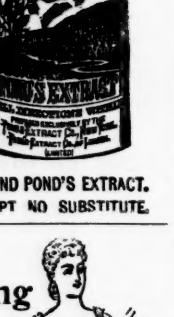
IN 1856 W. S. and C. H. Thomas originated the business of manufacturing corsets, which firm, after some changes, became Langdon & Batcheller, Mr. George C. Batcheller having been a partner since 1865. Under this firm name the concern obtained great prominence and now, with the beginning of the year 1898, the house continues under the firm name of Batcheller & Company, the partners in the new firm being George C. Batcheller, Frank I. Perry, George C. Miller, John A. Kernan and William H. Batcheller. The factory, which is at Bridgeport, Conn., is one of the largest and most complete in existence and regularly employs about one thousand hands. The firm make from 300 to 400 different styles of corsets. The well known "glove fitting" corset of their manufacture has a tremendous sale based entirely upon its absolute merits.

For Piles, Burns, Bruises, Wounds, Chafing, Catarrh, Soreness, Lameness, Sore Eyes, Inflammation, Hemorrhages,

USE POND'S EXTRACT.

DEMAND POND'S EXTRACT. ACCEPT NO SUBSTITUTE.

A Perfect-Fitting Corset



is the most important item of a woman's dress. Her comfort, style and grace of figure, and the fit of her dress, all depend upon the corset. The leading dressmakers always prefer the Glove-Fitting

corset to any other, because they are absolutely certain of the result. The GLOVE-FITTING corset is warranted, and its price is refunded if it should not be satisfactory. Celebrated as the most perfect-fitting corset in the world. Sold by all leading houses.

LANGDON & BATCHELLER'S GENUINE THOMSON'S GLOVE-FITTING (TRADE MARK)

DUNLAP'S

Spring Styles of Gentlemen's Silk and Felt Hats are NOW ON SALE.

The E. S. Greeley & Co.

Successors to L. C. TILLOTSON & CO.,

NOS. 5 & 7 DEY STREET, - - - - NEW YORK.

MANUFACTURERS AND IMPORTERS OF AND DEALERS IN

Telegraph, Telephone, Electric Light, Power, Railway and General Electrical Supplies.

We own and operate the Greeley Electrical Laboratory, where we manufacture a full line of Test Instruments and All Scientific Electrical Measurement Apparatus.

The Schoenberg Annunciator Reset.

Insurance.

ASSESSMENT ACCIDENT INSURANCE—A DISTINCTION.

THE inclosed document influenced me to drop my U. S. M. A. A. certificate and take a policy in the Travelers.

I became convinced from the arguments of the Travelers and its agents that the system was wrong, and would result in failure sooner or later.

If this is true it is not genuine insurance, and ought to be shown up as vigorously as assessment life insurance.

Is not counterfeit accident insurance as bad as counterfeit life insurance?

If the United States can and really does do what it claims—viz., sell accident insurance at one-half the cost of stock companies—ought not the stock companies to be shown up for charging twice what is necessary?

One or the other is wrong, and should be exposed.

Well, we think our friend erred in allowing himself to be influenced thus by the reading of *any* document. It is a very rare and very desperate cause on behalf of which something cannot be said, and it is always wise to hear the other side before deciding. He might well have submitted the document to the U. S. Mutual people, who might have had something to say about it; what they said—or their failure to say anything—would in that case have probably satisfied him that the document is easily answered or else not answerable at all.

The document is an eight-page circular, bearing no name as writer, publisher or circulator, and credited to nobody; it appears from internal evidence to be circulated by the Travelers, but it is anonymous notwithstanding. Its title-page is "The Reason Why; Facts and Theories hand in-hand; The Nature of Accident Hat-passers and the Seeds of Ruin in them; Bound to Fail and Always Do Fail." We do not accept this as sound, for there is a broad and essential distinction between insurance against death and insurance against accidental injuries. The one contingency will certainly happen, and the probability of it increases with age; the other probably will not happen at all, and the chances of it do not increase with age. This fundamental difference puts assessment accident insurance on another ground than that occupied by assessment life insurance, and makes the argument against the latter inapplicable. The anonymous writer of this tract recognizes that he could not be permitted to pass this difference outright, and he slides over it lightly at the outset by just mentioning it as among the questions often asked. His points are: (1) that an assessment society lives at the mercy of a day's chance, being sure to go to pieces as soon as a short run of bad luck comes ("which by the law of probabilities is sure to come"); (2) that the proportionate cost of operation is generally very much greater in the assessment society rather than less; (3) that the management can from the nature of things be rarely at once able and honest; (4) that an assessment accident society has no permanent principle of adhesion and "one a century old (if such a thing were conceivable) would be exactly as sure to dissolve the instant a serious loss fell upon it as one formed the year before."

It would be quite true that an assessment society might easily break in case an extraordinary loss fell upon it, if such societies had no accumulations at all, but in fact they do have some accumulations. If a large enough number of members should be bunched in one fatal calamity, the society would be broken; the Travelers itself would be broken, on the same condition, altho what would in that case be a "large enough" number is very problematical. If the members of the U. S. Mutual should crowd on the Bridge and the Bridge should drop, the society would drop also; and if a hundred thousand members in the Mutual Life should

die of cholera on the same day, the company could hardly survive. We need not worry about imaginary contingencies, and as for the assertion of this writer that an assessment accident society grows weaker instead of stronger with time, for "age only brings nearer the certainty of some rushing calamity that will end its days," that is what is called "begging the question." His argument runs in a circle thus: such a society is bound to break; the fact that it has gone on many years without breaking does not help it, because it has got to break and therefore the older it is the nearer it is to the breaking time. As for his other propositions, we do not see that he makes any headway in establishing them.

The United States Mutual is in its sixteenth year, and has a larger line of risks outstanding than the Travelers itself; it appears to be flourishing, and we do not feel called upon to act as its champion. Still less do we wish to antagonize the Travelers, which is an able and fearless fighter—so able and fearless that we should much rather see it issue officially in its own name and ably prepared (which it is amply able to do) whatever it wants to say to the public about accident insurance. Nor do we assume herein to recommend either the Travelers or the plans of its assessment competitors to those who want accident policies—let them decide for themselves. Our purpose has been only to point out a genuine distinction and incidentally to remark that anonymous leaflets are likely to be untrustworthy as well.

RE THE HARTFORD LIFE AND ANNUITY CO.

SEVERAL have lately addressed us inquiries regarding the Hartford Life and Annuity Co., particularly, whether we consider it safe and its Safety Fund a redeeming feature grafted upon the assessment plan. We have not watched this society's course of late years, but on December 8th, 1887, we made a careful examination and statement of the conditions of the contract and the relation of the Safety Fund, as far as these could be understood. There was no provision then for using this Fund, except that the interest was to be applied upon assessments after it reached $300,000. After reaching the $300,000, there was a stipulation that if the company by reason of insufficient membership could not pay, or if it refused to pay, the face of a maturing certificate, the aggrieved party could apply directly to the trustee of the Fund for relief. But the evidence to this condition of things, as was provided with perfect clearness, was to be either an official certification from the company itself that the claim was justly and legally due, and that payment had been demanded and refused," or an attested copy of a *final* judgment in a court of competent jurisdiction and for sixty days unsatisfied. So if the company did not pay and refused to certify to the fact, a claimant must sue and must persevere unto success in a court of last resort, it was also provided that the claim should become void unless sued upon within a year. And when access to the Fund was obtained for the purposes of relief, it was distinctly provided that instead of paying the claim out of the Fund, the Trustee was to convert it into cash and then—"less the reasonable charges and expenses for the management and control of said Fund"—to divide it ratably among all certificate holders. Upon this, we remarked, at that time, that "instead of being a Guaranty Fund which can be used it is one which cannot be."

A circular now before us says that the object of this Fund is, "First, to keep the cost insurance, by means of its dividend surplus, at the minimum point for which sound insurance can be furnished; secondly, to furnish ample security for the payment of the face value of every policy." It is stated to now exceed $750,000, and its limit is a million "for the reason that such sum, together with the future payments of members, is sufficient to secure the payment of the face value of every policy which the company issues." When the million is made up, if the amount of insurance at risk should fall below a million, the trustee (this circular states) would be required to divide the Fund among the members, thus paying its existing certificate in full forthwith; this promises safety for the last remaining members, but until the aggregate falls below a million and the Fund has worked up to a million there is no way suggested in this circular for making the Fund available.

The usual table is printed, showing a very low "actual cost for the past five years in this company," but for the thousandth time we have to say that we do not know any successful plan for beating the arithmetic. Life insurance is an accumulation. Without money enough, no accumulation; without accumulation, no insurance. As for the particular question whether this safety fund meets the usual difficulty, we condemned the plan as having catches and tricks in it five years ago, and if these have since been modified we still do not see that the defect has been cured. Our simple and direct counsel to everybody who thinks of going into any assessment organization whatever is to first call upon the nearest agent of a reputable regular company and ask him to be shown the best his company can do in low-cost life insurance. The alternative is sharply drawn and inexorable. Whatever any organization and any plan can do in this desirable direction the regular companies can do; there is no short-cut open, and no advantage over them can be obtained. Doubtless lower figures than theirs can be obtained in some other quarters, for promise always costs less than fulfillment; but, as we have said, go first and ascertain what they can do.

THE METROPOLITAN.

DURING the past year a new building has been in process of erection at the northeast corner of Madison Avenue and Twenty-third Street, fronting directly on Madison Square. As it has steadily approached completion and its wonderful beauty has grown from day to day, the question has been asked, "What building is that?" The Metropolitan Life Insurance Company are the owners and builders of this imposing specimen of architecture, which they have happily called "The Metropolitan." Built of white marble, it has been elaborately and artistically carved, and is ten stories in hight. The effect, now that it is nearly completed, is striking indeed. It is, in our opinion, one of the very few really beautiful and artistic office buildings in this city. It is certainly a magnificent building. The Metropolitan Life Insurance Company will occupy for their own business needs four or five of the lower floors, and the five upper ones will be rented. The building is, from its position, exceptionally well lighted and ventilated, is absolutely fireproof, and is provided with all the best-known and latest-devised appliances for comfort, health and convenience. It will have fast-running elevators, and the outlook from its windows is superb.

Much of the rapid development of the Metropolitan Life is owing to the great ability as a life underwriter of its President, John R. Hegeman. Its ratio of surplus to liabilities is one of the largest of any life insurance company.

INSURANCE STATEMENT.

THE EQUITABLE LIFE ASSURANCE SOCIETY.

EVERY reader of THE INDEPENDENT will of course give the thirty-third annual statement of the Equitable Life, published this week, the closest attention. The statement is looked for annually by a very large number of persons who are financially interested as holding its policies, who are holders of policies in other companies, and who are interested generally in financial and insurance matters. We are glad to note a departure of the Equitable in the right direction in its report that the new business written in 1892 was $33,000,000 less than in 1891. This indicates that the Equitable is out, and wisely, of the tremendous competition among the companies for new business. Reforms in the existing methods of conducting life insurance can best be inaugurated by the great companies; the smaller but equally good ones will be glad to conform to the new order of things. The total assets of the Equitable are $153,060,052.01, the liabilities, $121,870,236 52, and the total undivided surplus $31,189,815.49, and it has outstanding assurance of $850,962,245. The figures given by the Equitable in its surplus are simply colossal, not easily grasped or understood; and we must leave every person who reads the statement to do his best to comprehend them. A large part of the extraordinary success achieved by the Equitable Life has been owing to the able and skillful management of its President, Henry B. Hyde, who is ably assisted by James W. Alexander, Vice President, and a Board of Directors comprising many of the best financiers and business men in the country.

INSURANCE.

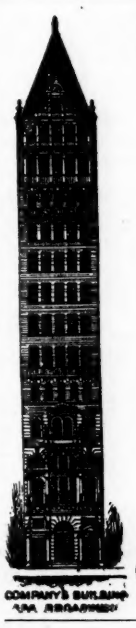
1851. 1893.

THE
MASSACHUSETTS
MUTUAL LIFE
INSURANCE COMPANY
OF
SPRINGFIELD, MASS.

Massachusetts Laws protect the policy holder.

AGENTS WANTED.

M.V. B. EDGERLY, President.
JOHN A. HALL, Secretary.


COMPANY'S BUILDING
NOW ERECTED

HOME LIFE INSURANCE CO.,
NEW YORK.

DISTRICT REPRESENTATIVES.

NEWELL & SCHROETTER, 314 Home Insurance B'ld'g, Chicago, Ill.
W. L. MORE, 118 Drexel Building, Philadelphia, Pa.
G. W. GODDARD, 119 Devonshire St., Boston, Mass.
BRUEHL HAEUSSLER & Co., 82 West 3d St., Cincinnati, Ohio.
E. C. GILMAN, Ernest Cranmer Building, Denver, Colo.
H. M. LEONARD, 341 Main Street, Dallas, Texas.
W. H. DUNPHY, Flood Building, San Francisco, Cal.
G. E. CLEVELAND, 223-224 Washington, Tacoma, Wash.
S. F. ANGUS, Hammond Building, Detroit, Mich.
H. B. MOESER, 531 Wood Street, Pittsburgh, Pa.
L. H. SCHNEIDER, Butler Exchange, Providence, R. I.
B. G. CARPENTER, 40 Broadway, N. Y. City.

GEO. H. RIPLEY, Pres. ELLIS W. GLADWIN, Sec'y.
GEO E. IDE, Vice-Pres. WM. A. MARSHALL, Actuary.

"THE METROPOLITAN."

The Home Office Building of the Metropolitan Life Insurance Company, corner of Madison Ave. and 23d St., will be ready for occupancy May 1st.

There are offices for rent on the 6th, 7th, 8th, 9th and 10th floors, which may be inspected now on application to the undersigned.

They are all exceptionally well lighted and ventilated. The building is absolutely fireproof, and is provided with the best-known and latest-devised appliances to promote the health, comfort and convenience of tenants.

HORACE S. ELY, 64 Cedar Street, New York.

SPECIMEN COPIES.

Any subscriber of THE INDEPENDENT who would like to have a specimen copy of the paper sent to a friend can be accommodated by sending us, on a postal card, the name and address to which he would like the paper sent.

Life and Accident Insurance.

SUMMARY OF THE

43d ANNUAL STATEMENT

OF THE

ÆTNA LIFE INSURANCE CO.

Of Hartford, Conn.,

JANUARY 1, 1893.

Premium Receipts in 1892.....	$4,660,539 89
Interest Receipts in 1892.....	1,892,418 95
Total Receipts during the year.	6,552,958 84
Disbursements to Policy-holders, and for expenses, taxes, &c.	5,361,917 89
Assets January 1, 1893.....	38,675,518 07
Total Liabilities.....	32,610,478 10
Surplus by Conn., Mass., and N. Y. standard.....	6,065,039 97
Policies in force January 1, 1893, 81,289, insuring.....	132,778,465 94
Policies issued in 1892, 12,878, insuring.....	25,471,104 30

MORGAN G. BULKELEY, President.

J. C. WEBSTER, Vice-President.
J. L. ENGLISH, Secretary.
G. W. HUBBARD, Ass't Secretary.
H. W. ST. JOHN, Actuary.
GURDON W. RUSSELL, M.D., Medical Director.

OFFICE OF THE

ATLANTIC

MUTUAL INSURANCE COMPANY,

NEW YORK, January 24th, 1893.

The Trustees, in Conformity with the Charter of the Company, submit the following Statement of its affairs on the 31st of December, 1892.

Premiums on Marine Risks from 1st January, 1892, to 31st December, 1892.....	$3,690,250 88
Premiums on Policies not marked off 1st anuary, 1892.....	1,472,142 48
Total Marine Premiums.....	5,162,393 36
Premiums marked off from 1st January, 1892, to 31st December, 1892.....	3,759,193 05
Losses paid during the same period.....	$1,496,178 06
Returns of Premiums and Expenses.....	$738,617 09

The Company has the following Assets, viz:

United States and State of New York Stock, City, Bank and other Stocks.....	$7,816,455 00
Loans secured by Stocks and otherwise..	2,027,000 00
Real Estate and Claims due the Company, estimated at.....	1,029,345 26
Premium Notes and Bills Receivable.....	1,336,622 46
Cash in Bank.....	276,262 99
Amount.....	12,485,685 71

Six per cent. interest on the outstanding certificates of profits will be paid to the holders thereof or their legal representatives on and after Tuesday, the Seventh of February next.

The outstanding certificates of the issue of 1888 will be redeemed and paid to the holders thereof, or their legal representatives, on and after Tuesday, the Seventh of February next, from which date all interest thereon will cease. The certificates to be produced at the time of payment, and cancelled.

A dividend of forty per cent. is declared on the net earned premiums of the Company for the year ending 31st December, 1892, for which certificates will be issued on and after Tuesday, the Second of May next.

By order of the Board,

J. H. CHAPMAN, Secretary.

TRUSTEES:

J. D. JONES,	CHAS. H. MARSHALL,
W. H. H. MOORE,	CHAS. D. LEVERICH,
A. A. RAVEN,	EWD. FLOYD JONES,
JOSEPH H. CHAPMAN,	GEORGE H. MACY,
JAMES LOW,	LAWRENCE TURNURE,
WM. STURGIS,	WALDRON P. BROWN,
BENJAMIN H. FIELD,	ANSON W. HARD,
JAMES G. DE FOREST,	ISAAC BELL,
WILLIAM DEGROOT,	N. DENTON SMITH,
WILLIAM H. WEBB,	THOMAS MAITLAND,
HORACE GRAY,	GUSTAV AMSINCK,
WILLIAM E. DODGE,	JOSEPH AGOSTINI,
GEORGE BLISS,	GEORGE W. CAMPBELL,
JOHN L. RIKER,	VERNON H. BROWN,
C. A. HAND,	CHRIS. DE THOMSEN,
JOHN D. HEWLETT,	LEANDER N. LOVELL,
CHARLES P. BURDETT,	EVERETT FRAZAR,
HENRY E. HAWLEY,	WILLIAM B. BOULTON

J. D. JONES, *President.*
W. H. H. MOORE, *Vice President.*
A. A. RAVEN, *2d Vice President.*

New England Mutual

LIFE INSURANCE CO.

Post-Office Square, Boston, Mass.

ASSETS, Dec. 31st, 1892..	$23,026,000 61
LIABILITIES...	20,697,231 67
	$2,328,768 94

LIFE RATE ENDOWMENT policies are issued at the old life rate premium.

Annual Cash distributions are paid upon all policies.

Every policy has indorsed thereon the cash surrender and paid-up insurance values to which the insured is entitled by the Massachusetts Statute.

Pamphlets, rates and values for any age sent on application to the Company's Office.

BENJ. F. STEVENS, President.
ALFRED D. FOSTER, Vice-Pres.
S. F. TRULL, Secretary.
WM B. TURNER, Asst. Sec.

SPECIMEN COPIES.

ANY subscriber of THE INDEPENDENT who would like to have a specimen copy of the paper sent to a friend can be accommodated by sending us on a postal card, the name and address to which he would like the paper sent.

THIRTY-THIRD ANNUAL STATEMENT

EQUITABLE

LIFE ASSURANCE SOCIETY

OF THE UNITED STATES,

FOR THE YEAR ENDING DECEMBER 31st, 1892.

ASSETS.

Bonds and Mortgages.....	$21,983,944.02
Real Estate, including the Equitable Buildings and purchases under foreclosure of mortgages.....	23,912,412.49
United States Stocks, State Stocks, City Stocks, and other investments.....	75,084,749.48
Loans secured by Bonds and Stocks (Market value, $7,673,706).....	5,913,500.00
Real Estate outside the State of New York, including purchases under foreclosure.....	14,122,736.70
Cash in Bank and in transit (since received and invested)	5,554,006.66
Interest and Rents due and accrued, Deferred Premiums and other Securities.....	6,488,702.66
Total Assets, December 31, 1892.....	$153,060,052.01

We hereby certify, that after a personal examination of the securities and accounts described in the foregoing statement, we find the same to be true and correct as stated.

Thomas D. Jordan, Comptroller. Francis W. Jackson, Auditor.

LIABILITIES.

Reserve on all existing Policies (4% Standard), and all other liabilities.....	$121,870,236.52
Total Undivided Surplus (4% Standard), including Special Reserve of $2,500,000 towards establishment of a 3½% valuation.....	31,189,815.49
	$153,060,052.01

We certify to the correctness of the above calculation of the reserve and surplus. From this surplus the usual dividends will be made.

Geo. W. Phillips, J. G. Van Cise, Actuaries.

INCOME.

Premiums.....	$34,046,568.39
Interest, Rents, etc.....	6,239,669.10
	$40,286,237.49

DISBURSEMENTS.

Claims by Death and Matured Endowments.....	$10,859,373.04
Dividends, Surrender Values, Annuities and Discounted Endowments.....	5,675,074.94
Total Paid Policy-Holders.....	$16,534,447.98
Commissions, Advertising, Postage and Exchange.....	4,083,478.35
General Expenses, State, County and City Taxes....	3,544,021.01
	$24,161,947.34
New Assurance written in 1892.....	$200,490,316.00
Total Outstanding Assurance.....	850,962,245.00

DIRECTORS.

HENRY B. HYDE, President.

JAMES W. ALEXANDER, Vice-President.

Louis Fitzgerald,	John A. Stewart,	John D. Jones,
Henry A. Hurlbut,	Geo. C. Magoun,	Levi P. Morton,
Henry G. Marquand,	William M. Bliss,	Charles S. Smith,
Wm. A. Wheelock,	Wm. B. Kendall,	Joseph T. Low,
M. Hartley,	G. W. Carleton,	A. Van Bergen,
H. M. Alexander,	E. W. Lambert,	T. De Witt Cuyler,
Chauncey M. Depew,	H. S. Terbell,	Oliver Ames,
Charles G. Landon,	Thomas S. Young,	Eustace C. Fitz,
Cornelius N. Bliss,	John J. McCook,	S. H. Phillips,
August Belmont,	Daniel D. Lord,	Henry R. Wolcott,
E. Boudinot Colt,	Wm. Alexander,	J. F. DeNavarro,
John Sloane,	Horace Porter,	James H. Dunham,
S. Borrowe,	Edward W. Scott,	Daniel R. Noyes,
H. J. Fairchild,	C. B. Alexander,	M. E. Ingalls,
Eugene Kelly,	Geo. DeF. L. Day,	T. D. Jordan,
	Alanson Trask,	S. D. Ripley.

The Manhattan Life Ins. Co.

INCORPORATED - 1850 - NEW YORK.

NEW ENGLAND MUTUAL

LIFE INSURANCE COMPANY.

Post Office Square, - Boston, Mass.

Statement of Business for 1892.

Net Ledger Assets, Jan. 1, 1892....$20,702,344 87

RECEIPTS.

For Premiums.....	$3,021,100 08	
For Interest, Rents, and Profit and Loss	1,145,584 99	
	$4,166,685 07	
Less Taxes.....	50,013 43	4,116,671 64
		$24,819,016 51

DISBURSEMENTS.

Death-Claims	$1,290,554 50	
Matured and Discounted Endowments	243,332 00	
Cancelled and Surrendered Policies..	399,290 19	
Distribution of Surplus.	581,053 62	
Total paid to policy holders.....	$2,514,230 31	
Amount paid for Commissions to Agents, Salaries, Medical Fees, Advertising, Printing, Stationery, and all other incidental expenses at the Home Office and at Agencies....	566,590 17	
Amount paid for Accrued Interest on investments purchased during the year.....	8,165 39	3,088,985 87
Net Ledger Assets, Dec. 31st, 1892.		$21,730,030 64
Market value of Securities over Ledger Cost.....	$897,685 47	
Interest and Rents accrued Dec. 31st, 1892.....	234,075 52	
Net premiums in course of collection.	164,208 98	1,295,969 97
Gross Assets, Dec. 31st, 1892.....		$23,026,000 61

LIABILITIES.

Reserve at Massachusetts Standard 4 per cent.....$20,471,091 43		
Balance of Distributions unpaid.....	107,428 24	
Death and Endowment Claims approved.....	118,712 00	20,697,231 67
		$2,328,768 94

Every Policy has endorsed thereon the cash surrender and paid-up insurance values to which the insured is entitled by the Massachusetts Statute.—LIFE RATE ENDOWMENT Policies are issued at the old life rate premium—ANNUAL CASH distributions are paid upon ALL policies.

Pamphlets, rates, and values for any age sent on application to the Company's office.

BENJ. F. STEVENS, President.
ALFRED D. FOSTER, Vice President.
S. F. TRULL, Secretary.
WM. B. TURNER, Ass't Secretary.

CONNECTICUT GENERAL

LIFE INSURANCE CO.,

HARTFORD, CONN.

ASSETS, JANUARY 1, 1893.

Cash on hand and in Bank.....	$62,514 20	
Bonds and Stocks, at cost.....	392,995 03	
Mortgage Loans.....	1,479,216 33	
Collateral Loans.....	44,771 13	
Real Estate owned by Company, at cost.....	194,376 77	
Premium Notes on Policies in force.....	52,029 54	
Bills Receivable.....	847 03	
Agents' Balances.....	434 44	
GROSS ASSETS.....		$2,370,956
Add Interest due and accrued.....	$53,558 58	
Premiums deferred and outstanding (less cost of collection)....	56,369 60	
Excess of market value of Bonds and Stocks, above cost.....	33,844 22	143,772 40
		$2,370,956 87
LIABILITIES.....		1,851,877 74
Surplus to Policy-holders, by Conn. and Mass. standard.....		$519,079 13

T. W. RUSSELL, President.
F. V. HUDSON, Secretary.

1850. 1893.

THE UNITED STATES

LIFE INSURANCE CO.

IN THE CITY OF NEW YORK.

OFFICERS:

GEORGE H. BURFORD.....	President
C. P. FRALEIGH.....	Secretary
A. WHEELWRIGHT,.....	Assistant Secretary
WM. T. STANDEN.....	Actuary
ARTHUR C. PERRY.....	Cashier
JOHN P. MUNN.....	Medical Director

FINANCE COMMITTEE.

GEO. G. WILLIAMS.....	Pres. Chem. National Bank.
JULIUS CATLIN.....	Dry Goods.
JOHN J. TUCKER.....	Builder.
E. H. PERKINS, Jr.,	Pres. Importers' and Traders' Nat. Bank.

The two most popular plans of LIFE INSURANCE are the CONTINUABLE TERM POLICY which gives to the insured the greatest possible amount of indemnity in the event of death, at the lowest possible present cash outlay; and the GUARANTEED INCOME POLICY which embraces every valuable feature of investment insurance, and which in the event of adversity overtaking the insured may be used as COLLATERAL SECURITY FOR A LOAN, to the extent of the full legal reserve value thereof, in accordance with the terms and conditions of these policies.

Good Agents, desiring to represent the Company, are invited to address J. S. GAFFNEY, Superintendent of Agencies, at Home Office.

THE MUTUAL LIFE INSURANCE COMPANY

OF NEW YORK.

RICHARD A. McCURDY, PRESIDENT

Statement for the year ending December 31st, 1892

Assets, $175,084,156 61

Reserve for Policies (American Table 4 Per Cent.)	$159,181,067 00
Miscellaneous Liabilities,	734,855 67
Surplus,	15,168,233 94

Income.

Premiums,	$32,047,765 34	
Interest, Rents, &c.,	8,191,099 90	$40,238,865 24

Disbursements.

To Policy-Holders,	$19,386,532 46	
For Expenses and Taxes,	7,419,611 08	$26,806,143 54

The Assets are Invested as follows:

United States Bonds and other Securities,	$65,820,434 89
Loans on Bond and Mortgage, first lien,	69,348,092 54
Loans on Stocks and Bonds,	10,394,597 50
Real Estate,	15,638,884 26
Cash in Banks and Trust Companies,	7,806,672 55
Accrued Interest, Deferred Premiums, &c.,	6,075,474 87
	$175,084,156 61

Insurance and Annuities.

Insurance Assumed and Renewed,	$654,909,566 00
Insurance in Force,	745,780,083 00
Annuities in Force,	352,036 01
Increase in Annuities in Force,	$82,732 98
Increase in Payments to Policy-Holders,	630,820 60
Increase in Receipts,	2,604,130 71
Increase in Surplus,	3,137,266 78
Increase in Assets,	15,577,017 93
Increase in Insurance Assumed and Renewed,	47,737,765 00
Increase in Insurance in Force,	50,295,925 00

NOTE—In accordance with the intention of the Management as announced in November, 1891, to limit the amount of new insurance actually issued and paid for in the accounts of the year 1892, to One Hundred Million Dollars, the amount of insurance in force as above stated includes the amount of such voluntary limit with but a slight increase unavoidable in closing the December accounts

I have carefully examined the foregoing Statement and find the same to be correct

A. N. WATERHOUSE, Auditor

From the Surplus a dividend will be apportioned as usual

BOARD OF TRUSTEES.

SAMUEL D. BABCOCK	HENRY W. SMITH	GEORGE BLISS	STUYVESANT FISH
GEORGE S COE	ROBERT OLYPHANT	RUFUS W. PECKHAM	AUGUSTUS D. JUILLIARD
RICHARD A. McCURDY	GEORGE F. BAKER	J. HOBART HERRICK	CHARLES E. MILLER
JAMES C. HOLDEN	DUDLEY OLCOTT	WM. P. DIXON	WALTER R. GILLETTE
HERMANN C. VON POST	FREDERIC CROMWELL	ROBERT A. GRANNISS	JAMES E. GRANNISS
ALEXANDER H. RICE	JULIEN T. DAVIES	HENRY H. ROGERS	DAVID C. ROBINSON
LEWIS MAY	ROBERT SEWELL	JNO. W. AUCHINCLOSS	H. WALTER WEBB
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	CHARLES R. HENDERSON	WILLIAM BABCOCK	

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WILLIAM J. EASTON, Secretary — HENRY E. DUNCAN, Jr., Cor. Secretary

FREDERIC CROMWELL, Treasurer

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JOHN TATLOCK, JR., Assistant Actuary — CHARLES B. PERRY, 2d Assistant Actuary

WILLIAM G. DAVIES, General Solicitor — WILLIAM W. RICHARDS, Comptroller

MEDICAL DIRECTORS

GUSTAVUS S. WINSTON, M.D — ELIAS J. MARSH, M.D — GRANVILLE M. WHITE, M.D

THE BERKSHIRE

Life Insurance Company

OF PITTSFIELD, MASS.,

Issues all approved forms of Life and Endowment Policies subject to the non-forfeiture laws of Massachusetts.

NEW YORK, 271 Broadway,
PHILADELPHIA, 512 Walnut Street.
BOSTON, 40 Water Street.

WE PAY POST-AGE All you have guessed about life insurance may be wrong. If you wish to know the truth, send for "How and Why," issued by the PENN MUTUAL LIFE, 921-3-5 Chestnut Street, Philadelphia.

American FIRE Insurance Company, Philadelphia.

EIGHTY-THIRD ANNUAL STATEMENT.

Cash capital	$500,000 00
Reserve for reinsurance and all other claims	2,541,873 61
Surplus over all Liabilities	141,428 86

TOTAL ASSETS, Jan. 1st, 1893, $3,183,302 47

THOMAS H. MONTGOMERY, President.

HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO. HARTFORD, CONN.

J. M. ALLEN, President.

W. B. FRANKLIN, Vice-President.

P. B. ALLEN, 2d Vice-President.

J. B. PIERCE, Secretary and Treasurer.

STATE MUTUAL

LIFE ASSURANCE COMPANY,

OF WORCESTER, MASS.

A. G. BULLOCK, President

January 1st, 1893.

ASSETS	$8,093,055 23
LIABILITIES	7,069,868 66
SURPLUS (Mass. Standard).	$1,023,186 57

Cash surrender values stated in every policy, and guaranteed by the Massachusetts Non-Forfeiture law.

NEW YORK OFFICE, 189 Broadway,

C. W. ANDERSON, Gen. Agt.

Continental

INSURANCE COMPANY,

OF NEW YORK CITY.

Extract from statement made January 1st, 1893

Cash Capital	$1,000,000 00
Reserves for Insurance in force, etc	3,594,315 77
Net Surplus	1,785,864 96
Policy-holders' Surplus	2,785,864 96
Gross Assets	6,380,180 73

SAFETY FUND POLICIES ISSUED.

F. C. MOORE, President.

HENRY EVANS, Vice-President.

CYRUS PECK, Treasurer.

EDWARD LANNING, Secretary.

WM. A. HOLMAN, Ass't Sec'y.

MAIN OFFICE,

100 Broadway, New York.

After May 1st, 1894, Main Office will be at 44 to 48 CEDAR STREET.

C. H. DUTCHER, Secretary Brooklyn Department, Court and Montague Streets, Brooklyn, N. Y.

J. J. McDONALD, General Manager Western Department.

R. J. TAYLOR, General Adjuster; GEO. E. KLINE, Assistant to General Manager, Rialto Building, Chicago, Ill.

D. B. WILSON, General Manager Pacific Coast Department.

F. C. BAKKMAN, Assistant to General Manager, 321 Pine Street, San Francisco, Cal.

RESPONSIBLE AGENTS WANTED.

FORTY-EIGHTH ANNUAL REPORT

OF THE

New York Life

INSURANCE COMPANY,

OFFICE: 346 & 348 Broadway, New York.

JANUARY 1st, 1893.

This is the only Company holding an Official Certificate of Examination, of recent date, from the State Insurance Department. The Assets, Accounts and Surplus to policy-holders have been certified to under the seal of the State by the Insurance Superintendent.

ASSETS.

Real Estate	$12,531,016 75	
Stocks and Bonds	86,680,177 51	
Bonds and Mortgages	24,236,785 51	
Loans secured by collaterals	3,916,000 00	
Premium Loans	1,096,850 03	
Cash in Office and in Banks and Trust Companies	4,201,283 68	
Interest and Rents due and accrued	971,810 14	
Net amount of uncollected and deferred premiums	3,865,275 87	
Total Assets		$137,499,198 99

LIABILITIES.

Reserve, or Value of outstanding Policies	$119,075,888 00	
Other Liabilities	1,618,362 89	
TOTAL LIABILITIES		$120,694,250 89
SURPLUS, being the same amount which will be shown to be the Company's Surplus by the Annual Report of the New York State Insurance Department as of December 31st, 1892		$16,804,948 10

INCOME.

Total Premium Income	$25,040,118 93	
Interest, Rents, etc	5,896,476 90	
TOTAL INCOME		$30,936,590 83

DISBURSEMENTS.

Losses paid	$7,896,589 29	
Endowments paid	1,114,301 99	
Annuities, Dividends, Surrender Values, etc	4,984,121 05	
Total paid policy-holders	$13,995,012 33	
Commissions	4,178,316 60	
Agency Expenses, Physicians' Fees, Advertising and Printing	1,851,246 18	
Taxes, Salaries and other Expenses	1,629,715 65	
TOTAL DISBURSEMENTS		$21,654,290 76

Number of Policies issued during 1892 66,259. New Insurance, $173,605,070.

Total number of Policies in force January 1, 1893, 224,008.

Amount at Risk, $689,248,629.

NOTE AS TO STATEMENT.

The above statement corresponds in all respects with the official report of the Company, as it will be published by the State Insurance Department. No assets not acceptable under the law of the State, or the regulations of the Department are included, and the **SURPLUS ($16,804,948.10) IS THE EXACT SUM THAT WILL BE SHOWN BY THE SUPERINTENDENT'S ANNUAL REPORT.**

JOHN A. McCALL, President.

HENRY TUCK,	Vice-President.	E. N. GIBBS,	Treasurer.
A. H. WELCH,	2d Vice-President.	H. S. THOMPSON,	Comptroller.
G. W. PERKINS,	3d Vice-President.	C. C. WHITNEY,	Secretary.
R. W. WEEKS,	Actuary.	T. M. BANTA,	Cashier.
C. N. JONES,	Associate Actuary.	J. A. BROWN,	Auditor.
H. C. RICHARDSON,	Ass't Actuary.	D. P. KINGSLEY,	Supt. of Agencies.

A. HUNTINGTON, M.D., Medical Director.

S. H. CARNEY, M.D., Associate Medical Director.

M. L. KING, M.D., Assistant Medical Director.

O. H. ROGERS, M.D., Assistant Medical Director.

TRUSTEES.

WILLIAM H. APPLETON,	CHARLES S. FAIRCHILD,	WOODBURY LANGDON,	EDM'D D. RANDOLPH
C. C. BALDWIN,	EDWARD N. GIBBS,	JOHN A. McCALL,	HIRAM R. STEELE,
WILLIAM A. BOOTH,	WILLIAM B. GRACE,	HENRY C. MORTIMER,	WILLIAM L. STRONG
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JOHN CLAFLIN	WALTER H. LEWIS,	AUGUSTUS G. PAINE	A. H. WELCH,

WILLIAM C. WHITNEY.

Old and Young.

A REMONSTRANCE.

BY GEORGE COTTERELL.

1.

Alas, is the world so old?
And is beauty withered and dead?
And is all this story told—
Nothing left to be said?
Old—the dear mother—not old!
She is younger than ever to-day;
Never since poet hath sung
Was the dear old earth so young.
Look! where the sunbeams play,
Through the leaves, on the ground below;
Get some of their warmth, and throw
Their brightness into thy song—
Let the morning breeze blow through it,
And the morning dew bedew it—
All the true and tender voices
Of sweet Nature that rejoices,
Let but these give music to it,
Laughing sun and joyous rain,
And thou shalt not sing in vain.

2.

Build thy watch-tower broad and high,
Watch the days as they go by,
Seize them singly as they fly;
Look along from west to east,
See the morrows ere they dawn,
Sing of greatness to be born
When the ages have increased:
Poet-seer, prophet-poet,
What thou seest, what thou hearest,
Of the world to which thou'rt nearest,
Tell thou us, who long to know it;
And tho few there be that heed
While thou droppest in the seed,
When comes up the golden grain
Thou shalt not have sung in vain.

York, England.

THE DOVE COLORED SILK.

BY ISABEL GORDON.

"It's clear temptin' uv Providence. That's what 'tis, Sarah Brackenridge; 'n' you'll find it out. The idee uv a dove-colored silk fur mournin'! I never heered tell uv sech a thing, fur's I know."

"'Tain't mournin', 'n' I never said 'twuz," said Mrs. Brackenridge, sulkily.

"No, mebby its rejoicin' 'cause Josiah's gone."

"'Taint rejoicin', erzackly," said the old woman, in a voice so positive that anybody who was trying to reason with her might have given up in despair. When a woman's voice takes on such a tone a lifetime's reasoning would not be apt to turn her a thumb's breadth.

"We'l," snapped out the other old woman, whose face was flushed from the effort of vain discussion. "Go ahead 'n' hev' your own way. You wuz allus a master hand at that with ev'rybuddy—'ceptin' Josiah; 'n' I think you'll own up you never moved him very fur. I s'pose you'll be hevin' a white hat with pink roses on it 'n' long white streamers, like Cassie Robinson's." And she laughed a little, cackling, triumphant laugh, which would have grated harshly on any hearer, but it fairly rasped on her neighbor's worn nerves.

"I hedn't no thought uv sech a thing," said Sarah, angrily; "but it's jest like you tew say it, 'n' Josiah layin' in there cold 'n' dead, too;" and she pointed her long, lean finger over her shoulder at the closed parlor door.

"Well, you deserved it," said Mrs. Baxter, glumly. "The idee uv you gittin' a dove-colored silk fur mournin'. It's the awfullest thing I ever heered tell uv; 'n' you know how folks 'll talk."

"Let 'em,' said Sarah, defiantly. "'Tain't likely I'll ever wear out two new gowns, 'n' I've wore black all my life, 'cause Josiah made me. He thought 'twuz econermy; 'n' I hate it worse'n p'isen. I've wanted a dove-colored silk sence ez fur back 's I can remember. I've saved 'n' saved fur it time 'n' ag'in, 'n' ev'ry time Josiah 'd find I had the money he'd take it; 'n' ef I don't git it now I'll never hev it; 'n' that's jest the upshot 'n' the downshot uv the hull business."

"Jest think how it'll look on you," said Mrs. Baxter, pitilessly; "you're 'most ez old's I be, 'n' I'm sixty-eight, 'n' you're sights yellerer 'n' peekeder 'n' I be; 'n' I wouldn't think uv wearin' a dove-colored silk, no more'n nothin'." She looked at her old neighbor in a scornful sort of fashion as she smoothed down the folds of her faded brown dress and set her cap straight.

"I don't care, Ellen Baxter, ef 't don't look good on me. I'm goin' tew hev it anyhow. An' you know that once I could hev set it off. When I got married I wuz counted sights handsomer'n you ever wuz, ef I dew be yellerer 'n' peekeder now. I'm goin' tew git fourteen yards 'n' hev Miss Gill make it 'n' put trimmin's on tew 't, 'n' them long narrer white buttons; 'n' I don't care if the hull Center laughs 'n' stares. I'm goin' to have a dove-colored silk afore I die. An' I'm goin' tew leave word to be laid out in 't, tew."

"Well, it beats all; 'n' what be you goin' to hev fur a bunnit?"

"Oh, I'll hev that crape," said Sarah, resignedly; "an' I'll hev a long veil 'n' black gloves; but I'm goin' tew hev the dove-colored silk, 'n' I'd like tew see anybody hender me, ef they can;" and her feeble voice rose in a shrill little scream of defiance.

"Good land! hev it then, 'n' done with 't," snapped Mrs. Baxter; but I never in all my born days see'd nobuddy so sot on hevin' their own way. I've hed silks 'n' silks," she added with a little air of importance; "but I never feeled so about gittin' none uv them."

"Mebby it's 'cause I've never had one that I dew feel so," said Sarah, in a piteous tone. "I think ef you knowed, Ellen, how I've longed 'n' longed—'n' even prayed," she added, shamefacedly, "fur a dove-colored silk, I dew b'lieve you'd look at it diff'rent. When I wuz a girl 'n' workin' out I began to save suthin' tew buy one tew get married in. I'd got enough 'n' wuz going tew buy it the next week when Josiah's mother died. Then he made me hurry up 'n' marry him, 'cause 'twuz so near hayin' time, 'n' he hadn't no help. He said I could git my clothes arter, 'n' make 'em ez I could arter doin' the work. At last I give in 'n' took him, 'n' didn't hev time tew git one new thing. When the work grew lighter I took the money I'd saved 'n' set out tew git a dove-colored silk; 'n' Josiah raised the awfulest fuss you ever heered. He said I wa'n't goin' tew spend that much on one gown, 'n' he wouldn't let me buy't even ef 'twas my own money. So I had tew give in 'n git a dull green delaine that he said he liked, 'n' I'd allus hated green like pisen. Time 'n' ag'in I saved a leetle off the chickens 'n' from pickin' berries or from a leetle extry butter; but Josiah would find it ez sure's fate, no matter whar I hid it, 'n' so I never got the silk, 'n' had hard work gittin' enythin' else. An' now I'm goin' tew hev it tho the hull Center gits sot ag'in me."

"Well, I dunno but I would ef I feeled so about it," said Mrs. Baxter, slowly; but I think you're in a sinful state uv mind, Sarah Brakinridge. Ef I wuz you, I'd pray fur strength tew be kep' from feelin' so."

"I don't want tew be kep' from feelin' so, fur's I know," Sarah answered, peevishly; "I want the dove-colored silk. The Lord used tew tell the Bible folks tew put on fine linen 'n' purple; 'n' I don't b'lieve he'd be ez dead set agi'n a dove-colored silk 's you be. It's sights less airy than purple."

"Land! how you dew talk," said Mrs. Baxter, with horror; "you speak jest ez ef the Lord had put it into yer heart tew git the silk."

"Well, mebby he did," answered Sarah. "I know what he did dew once. He put it into Viry's heart, who knew how I hankered fur a silk fur years 'n' years, tew send me money tew git it. She'd earned it hard at her teachin', 'n' she wrote the prettiest letter with it you ever see. I showed it tew Josiah ez proud's could be, 'n' he blew 'n' scolded like tunket 'n' wouldn't let me git it. He said I could git black or brown, but he wouldn't hev me in no shiny color. I wuz that mad I wouldn't hev nothin; so he paid for shinglin' the barn with it, 'n' I never got a penny uv the money. Poor Viry, I kep' puttin' off lettin' her know 'bout it, 'n' then she died afore she ever come back hum. I don't doubt but she took lots uv comfort, tho, thinkin' how happy I'd be with my dove-colored silk. But I never feeled ez ef I could forgive Josiah fur that. An' the churnin' I've done tew git some extra savin's! Up afore daylight, with sech churnfuls ez I could scarcely lift the dasher out o'nt. The butter would be hard tew come on cold mornin's, when my hands 'most froze tew the stick. An' then hot days 'twuz ez bad. Nuthin' would bring it, tho I'd churn fur hours 'n' hours 'n' hours. I guess ef there *is* some money left Josiah didn't earn 't all."

"Well, I never did see nobuddy ez sot's you be, Sarah Brakenridge," said Mrs. Baxter, putting on her shawl and bonnet as she prepared to go home. "I'll own up that I don't see much sense in mournin' myself. I dunno but dove-color shows you're ez sad's black would; but it's the custom. The hull world follers it, 'n' I dunno ez we Center folks kin set down on't."

"I tell you, Ellen, I don't care a cent 'bout custom. All I'm thinkin' uv is gittin' the dove-colored silk."

"Good land! I sha'n't say 'nother word. Git it ef you wan'ter. Dew you want anybuddy tew set up with you to-night. I s'pose I could come ef you ain't lottin' on nobuddy else."

"You're real good," said Sarah, wearily; "but I guess we'll git along. Mis' Slocum 'n' Samanthy are comin' over."

"Is there enythin' I kin help you with to-morrer?"

"I don't b'lieve there is. Persis Collins come 'n' did some bakin' this mornin'; 'n' I guess there's 'nuff cooked victuals. I don't s'pose thar'll be sech a raft uv folks, arter all. My brother Jabe 'll be here—thar's six uv them—'n' Huldy 'n' George Eagle, 'n' my sister's folks, 'n' Aunt Pettigrove, ef she kin move with the rheumatiz. But I don't believe there'll be more'n fifteen here, 'n' I've reckoned for twenty."

"Well, ef you're like to run short jest let me know. I baked this mornin', 'n' I've got pun'kin pies 'n' doughnuts 'n' some plain cake; 'n' you're welcome to them."

"You're real good," said Sarah again.

"I guess I'll be goin'," Mrs. Baxter said, tying her bonnet strings. "There's Mis' Slocum 'n' Samanthy comin' down the road 'n' its 'most supper time. I'll come over in the mornin' 'n' see ef there's anything to do, so good-night."

"Good-night," answered Sarah, as she stood in the narrow porch watching her guest plod slowly down the road in the dim twilight.

The funeral was held Thursday, and Josiah Brakenridge was laid away to rest in the hill graveyard where the Brakenridges had been buried for four generations. There was little pretense of mourning for him among the Center folks. He was a hard man, reaping where he had not sowed and gathering where he had not strewed. Nobody in the whole county could drive as hard a bargain as he could, and he demanded his bushel measure full to overflowing.

His wife knew him better than anybody else. Her married life had been one long drag of weary slavery. He had not abused her. Nobody laid that to his charge; but mean, grinding niggardliness is as much harder than abuse as a million pinpricks are than a sword thrust.

Sarah did not go to church Sunday. Her heart was set on her new silk, and pride would not allow her to appear in the old black gown which had seen the sun and snow of six years. So she stayed at home and read her Bible a little, and planned a great deal. She had made up her mind very decidedly but very quietly years and years ago as to what she would do when Josiah was taken. Nobody had ever been told of her plans, not even her only child, Elviry, who had died thirteen years ago in Nebraska. She had planned for a new Brussels on the parlor floor instead of the old rag carpet. She meant to change the east bedroom into a snug dining room, and quit eating in the big draughty kitchen. Then outdoors she intended, when spring came, to turn half the cabbage and potato beds into flower plots. If there was one thing Sarah Brakenridge's heart longed for more than the dove-colored silk, it was that she might have her yard gay and filled to overflowing with summer blossoms.

There was an old florist's catalog which she had pored over for many a year, picking and choosing the seeds and bulbs she would send for when Josiah was "taken." She never dared put Josiah's "being taken" into words; but the feeling had been with her for many a day, just as a prisoner looks forward to the morning when his sentence will be over and he can walk out into the glory of the sunshine.

Josiah had hated "poseys 'n' gardenin' 'n' putter'n' 'n' sozzlin' over things," as he said, "that you never made a cent on." Many a time Sarah's poor little tin cans, with their stunted bits of fuchsia and geranium, had been hurled over the fence. And as for flowers he said: "Land! the yard wuz full o' laylocks every spring, an' what more could a woman want than that?" Sarah had grown to hate these lilacs so, that one of her plans was to have them cut down as soon as the frost was out of the ground, and then she would make the front yard blossom like the rose. She had planned for zinnias and larkspur and sweetwilliams and love-lies-bleeding and many another old-fashioned flower which had bloomed in the yard at her girlhood home. She had marked some flowers of which she could not pronounce the name, and at whose beauty she could only guess from blurred illustrations. These were the ones she had never seen growing, and the delight of it would be to discover what they would be like.

Long after she had lit the lamp she pored over the tattered catalog, marking new varieties she had not noticed before and scratching out others which were "dreadful common." When night came the house seemed very lonely, and she began to stir about, locking up and preparing to go to bed. Even the thought of to-morrow's shopping expedition did not serve to distract her mind from the eerie loneliness of the house which had not been so silent for many a year. When the cat began to hide in dark corners preparatory to being driven down cellar she took it in her arms and carried it upstairs with her because it was the only live thing in the house.

She got up and peeped outdoors when daylight broke, and it was drifting and blowing. The thin fall of snow, which was scarcely shoe-deep on the frozen ground, was swirling wildly hither and thither, and the wind cut like a knife.

Sarah ate her frugal breakfast, then washed the few dishes, banked up the fire, and made her preparations for going into town. Going to town was one of the events of her life. The city was only ten or twelve miles distant, but she had not been there for several years. Josiah had seen to what shopping could not possibly be done in the tiny village, and Sarah had stayed at home. But now she might go into town every day if she wanted to, she told herself.

The stage which ran to the depot left the hotel piazza at nine o'clock, and she plodded down street with the wind fluttering her thin black gown, and the snow forming into hard balls on her rubber heels, which made her creep slowly and carefully along. The driver and the few village passengers looked curiously at her and nodded good-morning; but, in their country fashion, they longed to know what was taking the old woman into town.

"She's probably goin' in to Mr. McLennan's office," said Mrs. Miller to her sister. "They say Josiah died worth a sight o' money, 'n' he hain't no kith nor kin to leave a cent to 'ceptin' Sarah. Land! how he did hate to spend it; 'n' they say he hated to die worse 'n most folks do. When we git into town let's kind o' keep track o' whar she goes. I'm cur'ous to know what she's goin' to do. I don't know ef she's ez savin' ez Josiah wuz; but ef she is she'll make that old rusty gown go fer mournin', you see ef she don't."

They got off at the depot together, and the three women started for down town in the direction of the stores. But Mrs. Brakenridge left them at the block where Mr. McLennan's sign was hung out. He was her husband's lawyer. She did not dare risk life in anything so new-fangled as an

elevator, so she climbed flight after flight of the polished stairs and wandered down a long corridor till she found the place. She had been there before, years ago, with her husband when she signed "Sarah Brakenridge" to a document of which she was as ignorant as if it were the Koran.

Mr. McLennan was in, and he treated her, kindly and courteously, for she had money enough to make her a client worth keeping. Before she left she had signed her name to five or six papers whose contents the lawyer had patiently explained to her and she held in her tattered pocket-book eighty dollars in crisp new bills. It seemed such untold wealth that she scarcely dared to mingle with the throng on the crowded street, for she had vague ideas of pickpockets and confidence men. But the busy city people hurried on with never a thought to spare for the little, old bent woman in her rusty shawl and old-fashioned bonnet.

At last she reached the big dry goods store where she had come to help Viry get her things to go West. It was crowded, and she was hustled on from one counter to another by impatient clerks until the gentlemanly floorwalker escorted her to where they sold silk. A dapper young man who waited there scarcely deigned to see her, and when she asked for dove-colored silk he smiled benignly and told her that was a shade they did not keep—it was not among their new tints.

"I didn't hardly think 'twould be," said Sarah, timidly, "'cause 'tain't a new color. 'Twuz real fash'nable when I wuz a girl, 'n' when Viry 'n' me come here thirteen years ago you hed three or four pieces on 't. Mebby you dunno whar' it's kep'. 'Twuz an old man waited on me then; he'd black eyes 'n' white hair. He ain't 'round here now, be he?"

The floorwalker was on his rounds, and the young clerk felt a watchful eye on him. He tossed down one piece after another, dull grays and fawns and heliotropes, and asked Sarah if any of these was dove-color. But she could not find it; and at last she left reluctantly with a sad feeling that fashions had changed, and that old things had passed away.

"It's mighty queer," she said to herself, as she wandered down the thronged street. "Everybuddy wore dove-color when I wuz young, 'n' now they don't know even the name on 't."

She had a weary search; but she was not easily discouraged. She strayed from one busy fashionable store to another, but dove-color was not among the shades they kept. At last one clerk, whose kindly heart was touched by the old woman's wearied face, directed her to an old-fashioned store on a side street, where many a time one could match a fabric or color of days gone by.

The sky had grown leaden and the wind swept fiercely down the street, but Sarah plodded on, drawing her worn shawl tightly around her, and pulling her bonnet on a little straighter. She found the store, and they had the silk just the shade she wanted and stiff and heavy. It was only a dollar and a half a yard, the clerk told her. It had been reduced from two dollars because it was an old-fashioned shade which nobody called for nowadays. There was just enough left for one gown, and Sarah took the parcel eagerly as if afraid some one might claim what she had waited and longed for all her life.

Her cheeks were flushed, and she had almost forgotten it was cold as she hurried back to a milliner's store where she had noticed a sign "Mourning Goods a Specialty." There she got a crape bonnet with a long funereal veil. Then there were black gloves to buy and a black woolen shawl, and last of all the flower seeds. It took an hour to make that purchase. She had her old catalog with her, but the flower-seed season had not quite arrived, and there was much unearthing of other goods to reach the gayly decorated boxes.

It was three o'clock before she reached home and deposited her armful of parcels on the kitchen table. She had to lie down on the chintz-covered lounge for a breathing spell, which lasted for nearly an hour. She was "fairly tuckered out," she told herself, what with the wind and the cars and her hunt for that dove-colored silk. Then she rose up pale and weary to light the fire and get dinner, for she had not eaten a bite since breakfast time.

She had not quite finished her last cup of tea when there came a rap at the back door and Mrs. Baxter walked in. She was filled with vague curiosity, for she heard that Mrs. Brakenridge had come back from town with a new bonnet box and an armful of parcels. Sarah sipped her tea slowly. She knew very well what Mrs. Baxter had come in for. She felt a little pride and importance over her purchases, and she meant to let her wait till she got ready to undo the parcels. She was as eager for a peep at her treasures as Mrs. Baxter was; but she moved about deliberately, fixing the fire and washing her dishes as if these little duties were the most important things of life.

"Well, did you git it?" asked Mrs. Baxter, weary of waiting.

"Git what?" asked Sarah, pausing with an unwiped cup in her hand.

"Why, your dove-colored silk, uv course."

"Yes," said Sarah, as she went on with her dishes," "'n' the prettiest piece uv silk you ever see; 'n' I paid a dollar 'n' a half a yard fur it tew."

"Let me help you wipe," said Mrs. Baxter, bustling across the kitchen; "seems to me you're mortal slow."

"I'm tired to death. 'Tain't every day 't I go tradin'."

"That's so," said Mrs. Baxter, with a laugh which had a little ring of derision in it.

When everything had been put in order Sarah slowly undid her parcels, and Mrs. Baxter rubbed the silk between her finger and thumb.

"It's a real good piece, Sarah," she said at last—"real good; 'n' you got it dreadful cheap. My brown silk cost two 'n' a quarter, 'n' this is every mite ez good 's *it* wuz."

"'Tis good," Sarah said, slowly; "'n' I guess I'll git sights uv wear out on't. See my bunnit."

"Sarah Brakenridge, I wouldn't be in your shoes fur a farm. You'll look perfectly ridik'lous in that crape bonnet 'n' this silk. I do wish you'd got a black gown, 'n' then this would hev made good second mournin'."

"I tell you, Ellen, I didn't want no black, 'n' I'll never put on a black gown in my life ag'in, so there. I think you're jest ez hard's kin be to be goin' on 'bout that the hull time when my heart's bin sot on a dove-colored silk fur years 'n' years 'n' years."

Sarah was so tired and nervous that all her troubles culminated in a burst of tears as she laid her head on the kitchen table by her parcels.

Mrs. Baxter was somewhat sorry and a trifle ashamed of herself; but she was unwilling to own it, and she let Sarah cry on silently. She felt in her heart that she had not said anything more than the case deserved. At last she threw her shawl over her head and rose to go home. Sarah raised her blurred, pale face and opened the door for her, and then the old neighbors separated with a short good-night.

Sarah turned the lamp down low and sat by the glowing stove for an hour or so. Her thoughts had gone back to the days of her girlhood, when she was a rosy-faced, flaxen-haired girl with Josiah courting her in his slow, solemn fashion. She had such dreams then of how happy life would be. Then she thought of Elviry and of the days long before, when she had worked so hard and saved so closely to buy her wedding gown—the gown which she had only got to-night. Then she turned up the lamp and sat down to finger her purchases all over again. She lingered long over the brilliantly illustrated flower-seed packages. To her they held untold wonders of summer bloom. She could almost sniff the mignonet and sweet alyssum and clove pinks just as she did in dewy evenings at home fifty years ago. She could shut her eyes and see masses of bloom, with hollyhocks leaning up against the fence and balsams and marigolds and stocks and portulaca glowing in the sunshine.

Then the wind with a wintry voice went shrieking round the house, and she sighed; for there were long, dreary months ahead of spring days when she could scatter her seeds and then watch eagerly for tiny green blades to shoot up through the black mold. The rasping voice of the kitchen clock startled her; it was striking nine; so she gathered her purchases together and took them into the parlor, all but her dove-colored silk, which she carried upstairs.

The leaden clouds descended during the night in a heavy fall of snow, and the wind fell. The sun rose brightly over a white world, and its early beams streamed through the ragged green paper shade at Mrs. Brakenridge's chamber window. She had never slept over so long before. The kitchen clock was striking ten, and the cat, mewing pitifully, was wandering around the house seeking her mistress.

But she would never wake again. Her white, worn face was turned toward the window, and a beam of wintry sunshine flickered through a rent in the shade falling on the still features. Then it lingered for a moment on the sheeny folds of her dove-colored silk which lay on a little stand by the bedside.

SPRINGFIELD, MASS.

A WINTER HEARTH SONG.

BY P. MCARTHUR.

B r-r-r-r! B r-r-r-r! Huddle down warm!
Hear Jack Frost and his busy gang
Splitting the trees with their wedges of ice.
Listen and hear them! Bang! Bang! Bang!
And an owl on the barn shouts "Whoo! twoo-whoo!"
While somebody mocks her: "Whoo! twoo-whoo!"

Whack! Crack! Hey, what's that?
Jack Frost splitting the logs in the wall,
Pulling the nails from the clapboard roof.
Huddle down close in the warm old shawl!
And hear the old owl as she shouts "Twoo-whoo!"
And somebody mocks her, "Whoo! twoo-whoo!"

Jing-a-ling-jing! The sleighbells ring,
And frosty runners creak on the snow,
And a cheery voice that the baby loves
Is shouting busily "Whoa, there! whoa!"
And the owl in the woods shouts "Whoo! twoo-whoo!"
While somebody mocks her, "Whoo! twoo-whoo!"

Stamp! Stamp! Who's coming there?
Striking the snow from his hurrying feet?
"Hey there, baby! Give Papa a kiss,
And show him the warmest, cosiest seat!"
Now what care we for the owl's "Twoo-whoo?"
We will sit by the fire and mock her too.

BROOKLYN, N. Y.

THE LAST CLASS.

STORY OF A LITTLE ALSATIAN BOY.

FROM THE FRENCH OF ALPHONSE DAUDET.

TRANSLATED BY ELLEN SARGENT.

THAT morning I was very late in starting for school, and I was especially afraid of being scolded, as M. Hamel had told us he would question us on the participles, of which I did not know the first word. Suddenly the thought came to me to stay away from class and take my course across fields.

It was so warm, so clear! You could hear the blackbirds whistling at the edge of the wood, and in the Rippert meadow, behind the sawmill, the Prussian soldiers were at drill. All this tempted me much more than the rule for participles; but I had the strength to resist, and ran quickly toward the schoolhouse.

As I passed the mayoralty I saw some people standing near the wire grating on which public notices were hung. For the last two years, that was the place from which had come to us all the bad news—the battles lost, the levies, the orders of the *commandature;* and, without stopping, I thought:

"What is it now?"

Then, as I crossed the square on a run, Wachter, the blacksmith, who was there with his apprentice to read the notice, called out:

"Do not hurry thyself so, little one; thou'lt get there to thy school soon enough!"

I thought he was making fun of me, and, all out of breath, I entered the little yard of M. Hamel.

Ordinarily, at the beginning of school, there was such a clatter you could hear it out in the street; desks opened, closed, lessons repeated aloud and all together, each stopping his ears, the better to study, and the big ruler of the master tapping on the tables:

"More silence!"

I counted on all this bustle to help me reach my seat unobserved; but just this day all was peaceful as a Sunday morning. Through the open window I saw my companions already in their places, and M. Hamel, who passed and repassed with the terrible iron ruler under his arm. I must open the door and enter in the midst of that perfect quiet. Judge if I was red, if I was afraid!

But, no! M. Hamel regarded me without anger, and said very gently:

"Go quickly to thy place, my little Franz; we were going to begin without thee."

I sprang over the bench and seated myself immediately at my desk. Only then, a little recovered from my fear, did I notice that our master had on his beautiful green surtout, his neatly plaited shirt frill and the embroidered black silk skullcap which he wore only on inspection days or when the prizes were distributed. Moreover, the whole school had an air of something unusual and solemn. But what surprised me most was to see, at the end of the room, on the benches which were usually empty, the men of the village seated and silent like us; old Hauser, the aged Mayor, the ancient letter carrier, and some others besides. All these appeared sad; and Hauser had brought an old spelling book with ragged edges, which he held wide open on his knees, with his big spectacles laid across the page.

While I was wondering at all this, M. Hamel had mounted his chair, and in the same gentle, grave tone with which he had greeted me, he said to us:

"My children, this is the last time that I teach your school. The order has come from Berlin that henceforth only German shall be taught in the schools of Alsace and Lorraine. The new master comes to morrow. To-day is your last lesson in French. I beg you to be very attentive."

These few words completely upset me. Ah! the wretches, that was what they had placarded at the mayoralty!

My last lesson in French!

And I who scarcely knew how to write! I should never learn then! I must remain where I was. How I thought now of the time lost, of classes neglected for hunting birds' nests, or for sliding on the Saar! My books, which just before I had thought so tiresome, so heavy to carry, my grammar, my sacred history, seemed like old friends who pained me by leaving me. It was the same with M. Hamel! The idea that he was going away, that I should never see him more, made me forget the chastisements, the blows of the ruler.

Poor man!

It was in honor of that last class that he had put on his fine Sunday clothes; and now I understood why the old villagers had come to sit at the back of the room. That seemed to say they regretted they could not come there again to that school. It was also a way of thanking our master for his forty years of good service, and of paying their respects to the country which was going away.

I was in the midst of my reflections when I heard my name called. It was my turn to recite. What would I not have given to be able to say all that famous rule for the participles very loudly, very clearly, without a fault! But I entangled myself at the very beginning and remained standing, balancing myself in my seat, my heart swelling, not daring to raise my head. I heard M. Hamel speaking:

"I will not scold thee, my little Franz; thou art punished enough. That is how it is. Every day we say: 'Bah! I have plenty of time. I will study to-morrow!'

And then thou seest what happens. Ah! that is the great fault of our Alsace, always to put off her instruction until to-morrow. Now these men here are right who say to us: 'What! you pretend to be Frenchmen and you neither know how to speak nor to write your language!' In all this, my poor Franz, 't'is not only thou who art culpable. We have all a good part of the blame to bear.

"Your parents have not held you strictly to your studies. They preferred to send you out to work on the farm or at the cotton mills, so as to have a few sous the more. I, have I nothing to reproach myself with? Have I not often made you water my garden instead of studying? And when I wanted to go trout fishing, did I hesitate to give you leave of absence?"

Then from one thing to another M. Hamel began to speak of the French language, saying it was the most beautiful tongue in the world, the clearest, the most substantial; that we must keep it among us and never forget it; because, when a nation sinks into bondage, as long as it holds on to its language it is as if it kept the key of its prison. Then he took a grammar and read us our lesson. I was astonished to see how I understood. All that he said seemed easy—easy. I think, also, that I never had listened so well, and he had never put so much patience into his explanations. You would have said that before he went away the poor man wished to give us all his knowledge, to make it enter our heads at one blow.

The lesson finished we went to the writing. For this day M. Hamel had prepared some entirely new copies on which was written in good round hand: France, Alsace; France, Alsace. That had the same effect as some little flags which floated all around the class-room, hanging from the rods of our desks. You should have seen how each one worked, and what silence! You could hear only the scratching of pens on paper. Once some May bugs came in; but no one paid any attention, not even the very little ones, who applied themselves to tracing their pothooks with a heart, a conscience, as if even that were French! On the schoolhouse roof some pigeons cooed quite low, and, listening to them, I said to myself: "Are they not going to make them sing in German, those birds?"

From time to time, when I raised my eyes from my page, I saw M. Hamel motionless in his chair, and looking at the objects about him as if he would carry away in his mind all his little schoolhouse.

Think! For forty years he was there in that same place, with his yard opposite him and his class all expectant. Only the benches, the desks were polished, worn by use; the walnut trees in the yard had grown, and the hop-vine, which he himself had planted, now garlanded the windows up to the very roof. How heart-breaking it must be for this poor man to leave all these things and to hear his sister come, go, in the room above, preparing to close their trunks! For they must leave the next day, go away from the country forever.

All the same, he had the courage to hear each class to the end. After the writing we had the history lesson; then the little ones chanted the ba, be, bi, bo, bu. There, at the back of the room old Hauser had put on his spectacles, and, holding his speller with two hands, he spelled the letters with them. You could see he applied himself, he also; his voice trembled with emotion, and it was so droll to hear him that we wished both to laugh and to cry. Ah! I shall remember that last class.

Suddenly the church clock struck twelve; then the Angelus. At the same moment the trumpets of the Prussians, who were returning from drill, broke forth under our windows. M. Hamel rose, very white, in his chair. Never had he seemed so tall.

"My friends," he said—"my friends, I—I"—

But something choked him. He could not finish his sentence.

Then he turned to the blackboard, took a bit of chalk, and using all his strength he wrote as large as he could:

"*Vive la France!*"

Then he remained there, his head leaning against the wall, and, without speaking, with his hand he signed to us:

"It is finished—go."

NEW YORK CITY.

NOTHING BUT THE TRUTH.

BY ROBERT BEVERLY HALE.

TOM ADAMS had been doing something wrong, and he was ashamed of himself. He and his two older brothers had been told by their father to spend that morning in weeding the vegetable garden; and they had gone off to take a swim in the Big Pond, leaving their work half finished, with the hope that they could get back to their hoes before their father missed them. And now that they had resumed their work, they could hear Mr. Adams calling them, and they were ill at ease. On their way to the house, Edward and Giles had a conversation, in which they determined that if their father suspected them of leaving their work, and asked them if they had been in the pond, they should say "No," on the ground that they had not been in the regular bathing pond, the Little Pond, and therefore had not been in *the* pond. They had been in the Big Pond, in which, by the way, they were forbidden to bathe. Tom, being the youngest, as usual, took but a small part in the conversation.

Mr. Adams was a kind-hearted man, but he had a dreadful temper. When the three boys came into his study, they could see that he was in no pleasant frame of mind. He looked up at them for some time in silence, as if to give them a chance to become frightened. Then he turned his attention to poor Tom, who was standing behind his two brothers in an agony of fear. It was not entirely that he feared his punishment, tho Mr. Adams certainly did not spare the rod; but Tom hated to see his father so very angry with him. He would have given anything if he had only minded his business that morning. And when his father selected him from the three culprits as the one to be questioned, he felt that he should like to sink through the floor.

"Tom," said Mr. Adams, "you boys don't look as if you'd been working all the morning. Have you been in the pond?"

There was a pause for a moment. In that moment Tom felt his brothers' glances burn into him, and realized that they would be punished as well as he, if he told what they had been doing. In *the* pond! The Big Pond was certainly not *the* pond. His father, too; it seemed as if he could not bear to see him fly into one of his passions. And it was not very pleasant to be punished. *The* pond; that did not mean the Big Pond. Everything was forcing him one way. All this flashed through his mind in an instant. All of a sudden he looked his father full in the eye.

"Yes," said he, "we've been in bathing; and that's not the worst of it, for we've been in bathing in the Big Pond where you've forbidden us to go. We thought you wouldn't find it out."

If a traveler in a dreadful thunderstorm should suddenly see, instead of the thunderbolt he expected, a beautiful beam of sunshine coming down through the clouds, he would not be more surprised than was Tom Adams at the reception of his speech. Mr. Adams lay back in his chair and laughed loud and long. "That's right, my boy," said he; "don't stoop to the thousandth part of a lie. By George, you gave me the whole broadside hot and heavy. 'Where I had forbidden you to go,' you young scamp! Ha! ha! ha! Well now, to tell the truth, young Johnny Ryan came in here an hour ago and told me he'd seen you three scapegraces in the Big Pond; and I was pretty mad, I can tell you; but now that you've been so manly about it, I won't punish you. But mind you don't do it again. Ha! ha! ha! 'We thought you wouldn't find it out!' Ha! ha! ha!"

Tom's sister Eleanor was five years older than he; but they were very intimate, nevertheless. He was very proud of her confidence, and was able to be of use to her in a great many ways. She even asked his advice on some points, and sometimes even went so far as to take it.

One day, when they were having a conversation, Eleanor brought up a question of conscience.

"I was putting up the boys' workroom to-day," she said. "You know what a dreadful mess Giles keeps his things in; his papers all over the floor, and his boots on the table. It was so bad that he had asked me to clear it up. Well, in the course of picking up things from the floor, I came across a letter from Mr Dunham, his tailor. I don't know what induced me to begin to read it, but I did; and then I couldn't stop. I laid it down once; but somehow I couldn't help picking it up again. It was all about how the tailor couldn't afford to wait any longer, and if Giles didn't pay him right away he was going to law about it; and he would get the money or know the reason why. And the bill was for $112. And now I want to know, Tom; do you think it was very bad of me to read the letter? He oughtn't to have left it on the floor if he wanted it not to be read. It would have been different if it been his own room. But right in the boys' workroom! I don't think I did wrong, do you?"

"Yes, Eleanor," he answered; "I think you did wrong."

"But how was it wrong? What made him leave his letter on the floor if he didn't want it read?"

"Forgive me, dear Eleanor, but that has nothing to do with it. It's just a question of right and wrong with you. I think a good test of right and wrong is to think how you would look back on doing a thing. Don't you think if you had managed to keep from looking at the letter you would feel a little proud of your delicate sense of honor?

"Yes."

"And looking back on what you did do, are you proud of it?"

"Oh, Tom, not a bit."

"Well then—oh, do forgive me, Eleanor, for talking to you like this. You're not mad with me?"

"Not a particle; I like you all the better for it."

That evening Tom and Eleanor went to a party at a neighbor's house. Tom had been surprised and pleased that a boy of his age should receive an invitation to a grown-up party; but receiving the invitation was about all the pleasure he did get. He felt ill at ease among the older young people; he could not dance well, he could not talk about nothing so well as most people. He was not sorry when Eleanor came up, on her partner's arm, and asked him if he was willing to go home.

There were a number of young ladies saying good-by; and Tom waited for them to make their adieus before doing so himself. He was interested to hear what they had to say to their hostess as a farewell word.

"This has been the jolliest dance of the year," said one.

"What a splendid house for dancing!" said another.

"Every one has had a splendid time," said a third.

Now even Tom had observed that there were more ladies than gentlemen at the dance, and that it had gone off slowly in consequence. It had been what Eleanor called, "A very poky affair." So these rhapsodies displeased him, especially as he heard one of the rhapsodists say something very different when she was out of hearing of the hostess. When it came his turn he would naturally have said: "I have had a splendid time," but he reflected that such was not the case. He made up his mind that he would make no statement at all if he could not think of one at once true and agreeable.

The hostess took him by the hand.

"It was so good of you to ask me," said Tom.

"It was so good of you to come," said his hostess; "but I'm afraid you've had but a stupid time!"

At this moment Eleanor came up on her partner's arm, and engaged the hostess in such a flood of conversation that Tom was spared an answer, for which he devoutly thanked his stars and Eleanor. He has not yet thought how he could have constructed one at once agreeable and true.

Eleanor and Tom walked home together. The moon was not up; but they had the stars to look at, and the crickets to listen to, so there was no lack of company.

"Now I should like to know," said Eleanor, "what is the harm of telling the servant to say 'not at home' when I don't want to be disturbed. I know you think I oughtn't to do it; but why not? Language is only made to make people understand a thought; and every one knows that 'not at home' means the same as 'not receiving.'"

"Every one doesn't know it," replied Tom; "for I don't."

"Well then, why don't you think it means the same?"

"Because 'not receiving' means you're at home and don't want to see any one. 'Not at home' means sometimes that you are not receiving, and sometimes that you are not in the house. You say you are not at home, instead of saying that you are not receiving, so that people will think you may be out, and so will not be vexed at your being in and not wanting to see them."

"Yes, I think I do say it for that reason."

"In other words, 'not at home' means one thing to you, and you hope it will mean another thing to them. That's generally known as"—

"As a lie. Well, Tom, you may be right; but I must think it over first before I decide. Isn't the reflection of Jupiter in the Big Pond splendid?"

It was examination day at school. The President of the Trustees was going through the different classes to see how they were doing. Tom's class had a bad reputation. The teacher thought they did not study enough; and he had confided his opinion to the President of the Trustees, the Rev. Mr. Strafford. The president determined to sound the matter to the bottom. He began to go through the class, asking each member how long on the average he studied his home lessons. The boys made very different answers, but Tom could see that none of them were strictly true. The different boys said they studied anywhere from one to three hours. No one said less than one hour. Now Tom was an exceptionally bright boy, and he managed to get most of his lessons in school; so that, tho he stood second in his class, he only studied a short time at home. At last Mr. Strafford reached him.

"Adams?"

A multitude of thoughts came crowding through Tom's mind. If he said he only studied a short time the other boys would think he was trying to show how smart he was. Mr. Strafford would think he was defiant. The rule of the school was that each student should study as much as an hour. Several other fellows had answered "One hour" who studied no harder than he.

"Well, Adams, about how long?"

"From five to ten minutes on the average, sir."

There was a pause, and then a tumult of laughter from the boys. Mr. Strafford looked on Tom's record of marks and behavior, and found them above reproach.

"Even Nestor might have been wiser," he said. "We will pass on to the next. Goldthwaite, how long do you study out of school?"

Tom was telling a story at the dinner table. He had told the family that the most exciting thing he had ever seen had happened at school that day, and they were all listening intently. "You see," said he, "we're forbidden to throw any snowballs after the bell that's rung for us to come in at recess; but to-day the boys kept on pelting each other after the bell rang, and Mr. Eastman came running out to stop them. There were a lot of us down at the bottom of the yard and another crowd going into the schoolhouse. Well, he stood near the middle of the crowd that was going in, and shouted out: 'Stop that snowballing immediately

boys!' Then he turned round into the crowd and just then"—

Tom was going to say Billy Anderson threw a snowball that hit him square on the back of his head. But suddenly he reflected that he had not seen the snowball hit him. He had only heard some one say, "Did you see old Eastman's head?" Still, most of the boys seemed to think it hit him somewhere; they were not all sure about his head. Then it would make so much more of a story if he could say the snowball hit him on the back of the head.

"Well," said Eleanor, "don't keep us in such a dreadful suspense!"

"He turned round into the crowd," went on Tom, "and just then Billy Anderson fired a snowball right into the middle of the crowd. I don't know whether it hit old Eastman or not, but some of the fellows say it hit him on the back of the head; but anyway he turned round and gave us a terrible talking to; and that's the reason why I came home so late from school."

"Well," said Giles, "that is such an exciting anecdote it fairly takes my breath away."

And so the story ended in a laugh, in which Tom joined as heartily as anybody.

Some of the worst paintings in the world are family portraits. There seems to be some dreadful fatality about them; and yet fathers and mothers of families continue to have them taken. Mr. Adams was persuaded to have his picture painted; and for the artist he selected a distant cousin whose poor circumstances recommended him more than his talent. He worked on the picture for a great many sittings; and at last it was sent home. Most of the family said they would never have known it. Tom thought one eye was natural; and Giles admired the painting of the frock coat.

"Well, it's all very well to criticise," said Mr. Adams; "but some one really ought to go and thank him for his trouble and care."

There was some discussion as to the necessity of such a step; and finally it was decided that Tom and Eleanor should go immediately.

By the time they reached the studio Eleanor had framed her speech of thanks; and she could hardly wait to be admitted before beginning it.

"Mr. Shepard," she said, "we all want to thank you for the trouble and pains you have taken in painting Papa's picture. The picture shows the care you have taken. And Papa must be hard to paint. Will you accept our thanks?"

She held out her hand so frankly and pleasantly that Mr. Shepard could not but be pleased.

"I am so glad that you like it," he said. "I consider it an excellent likeness myself. But to think that you are all agreed that it is good, is more than I could have hoped."

Now Eleanor had not said that they were all agreed that it was good. "All" included Tom of course. He considered a moment whether he should speak up or not. If he did, it would hurt Mr. Shepard's feelings. It would also put Eleanor in an unpleasant position, and himself in a worse one. Why not leave well enough alone?

"I'm afraid you don't understand Eleanor, Mr. Shepard," he said. "I think all the family is obliged to you for the careful work you have put into the picture, but," he continued, disregarding Eleanor's frantic efforts to stop him, "as for myself, I cannot honestly say that I consider it a good likeness."

Eleanor tried to reprove Tom; but Mr. Shepard checked her. "Excuse me, Miss Adams, but that is just the sort of talk I like. Tom, I want you to come up and give me your opinion of some of my pictures once in a while. Oh, you don't know, Miss Adams, what it is to have a critic who will really tell you the truth!"

One day Mr. Adams came up to Tom very seriously.

"Will you come into the study, my boy," said he.

Tom went in, wondering what was the matter.

"Now, Tom," said his father, "I have noticed that at least for the last year you have never told a lie—not even a shade of a lie. Well, now I have a dreadful trial to put you to."

Tom breathed hard and set his teeth.

"Your mother and I have been thinking that you deserved some reward for all your difficult truthtelling. Now we have decided that if you like the idea, we will take you to Europe with us. No, don't interrupt. Now the question is—be sure you don't turn a hair's breadth from the truth—would you like to go with us?"

Tom did not know which way to look till at last he saw his father begin to smile. Then he faltered out a yes.

His father put his hand on his shoulder. "So it's 'yes,' is it? Well, my boy, it isn't always so hard to tell the truth, is it?"

ROXBURY, MASS.

PEBBLES.

"I FIND it is always best to keep cool," said the snow. "Exactly," replied the sidewalk, "I catch your drift."—*Washington Star.*

....*Caller:* "What are you looking through that big pile of comic papers for?" *Exchange Editor* (with a sigh of disappointment): "For fun."—*Chicago Tribune.*

....*Butcher:* "I need a boy about your size, and will give you $3 a week." *Applicant:* "Will I have a chance to rise?" *Butcher:* "Yes; I want you to be here at 4 o'clock every morning."—*Life.*

....In the Museum.—*Guide* (pointing to a large skull): "This, ladies and gentlemen, is the skull of Ignatius Loyola, and this," pointing to a much smaller one, "was his skull when he was six years old."—*La Lanterne de Cocorico.*

....An eastern Maine newspaper correspondent makes the surprising statement that a 380-pound minister in his town had the mumps on both sides of his face last Sunday, and yet was "not able to fill his pulpit"!—*Lewiston Evening Journal.*

....The Side-door to Literature.—"I never thought that Molly Brayuse would be foolish enough to marry Lord De Kay. She is not one I should expect to be fascinated by a title." "She isn't fascinated. She wants to get better prices from the magazines."—*Indianapolis Journal.*

....Some boys were asked what they knew about the Pharisees. "They are a mean lot, sir," said one boy. "Why do you say so?" "Because some of them brought a penny to Christ once, and he took it in his hand, looked at it, and said, 'Whose *subscription* is this?"—*Journal and Messenger.*

...."I thought it better to get you something useful," said Mr. Dossill to his wife, "so I have brought you a couple of good brooms for your Christmas present." "That was very thoughtful of you, my dear," replied Mrs. Dossill. "I share your ideas, and have bought you a good strong coal scuttle for you to carry up fuel from the cellar in."—*Judge.*

....*Uncle Mose:* "Was you up to de chu'ch dis mawnin', Ephra'm?" *Ephra'm:* "I was dar." *Uncle Mose:* "What was de tex'?" *Ephra'm:* "De tex' was dat de rich man shall nebber jump thro' de eye ob de caymel 'less he hol's a needle in his han'." *Uncle Mose:* "What de rich man wanter do dat foh?" *Ephra'm:* "I doan' know, Uncle Mose, but dat was de tex'."—*Puck.*

....His Natural Bent.—There was a large boiler of scalding water over a fire in the yard, and several black imps playing near it. Suddenly a shrill voice was heard from inside the shanty: "You, George Washington, keep away from dat ar boiler. D'rectly you is gwine ter upset de biler and scald yerself ter def, an' w'en you is, you'll be de fust one to say: ''Twasn't me, Mammy.''"—*Texas Siftings.*

....A Western member of Congress, who isn't much on society, but whose wife is, came home one afternoon in Washington and found her just returning from a round of visits. "Well, my dear," he inquired, "where have you been to-day?" "Out making party calls," she replied, with very apparent satisfaction. "Party calls," he repeated, in puzzled interrogation. "Yes, colonel, party calls." He studied over it for a minute. "Now, look here, Maria," he said, earnestly, "let up on that. You attend to society and leave the party to me. You don't know anything about politics, even if you are in Washington with me; and if you get to doing any party work you'll make a tangle of it sure;" and then Maria gave the colonel a laugh that made him wonder what he was there for.—*Detroit Free Press.*

PUZZLEDOM.

Communications for this department should be addressed "Puzzles," THE INDEPENDENT, *New York.*

CENTRAL ACROSTIC—*The Alphabet.*

Example—She*A*the.

1. The word across to inclose. The three letters on the left, a pronoun; on the right, an article.
2. Whole word, to avoid. Left, because; right, of the head.
3. Whole word, dead body. Left, a vehicle; right, an animal.
4. Whole word, for a bonnet. Left, a curse; right, a case.
5. Whole word, an incendiary. Left, an evergreen tree; right, an insect.
6. Whole word, to perplex. Left, to study; right, usage.
7. Whole word, found on oak leaves. Left drinking vessel; right, the whole.
8. Whole word, to recall to thought. Left, a wager; right, for writing.
9. Whole word, a covering for the head. Left, by; right, false hair.
10. Whole word, a French word of greeting. Left, the coffee tree, so called in Egypt; right, belonging to us.
11. Whole word, quantity gradually lost. Left, a meadow; right, era.
12. Whole word, a sort of grape. Left, a prickly thing, also spelled with the last letter doubled; right, an atom.
13. Whole word, a beacon at sea. Left, the ocean; right, an object to shoot at.
14. Whole word, a triumphal song. Left, a vegetable; right, a doctrine or theory.
15. Whole word, blind zeal. Left, large; right, endeavor.
16. Whole word, a clown. Left, to make a humming sound; right, kindred.
17. Whole word, pit. Left, equal value; right, not a word, but can be made an abbreviation of the future state of the world, "Unity everywhere triumphant."
18. Whole word, freak. Left, ornament for the head; right, an excellent thing in hot weather.
19. Whole word, the work of bees. Left, an insect; right, a thick substance.
20. Whole word, more in advance. Left, the skin of an animal; right, a pronoun.
21. Whole word, a mineral substance. Left, a small piece; right, mankind.
22. Whole word, common in quality. Left, for; right, an insect.
23. Whole word, used in kitchens. Left, a metal; right, existing.
24. Whole word, a man's name. Left, a beverage; right (two letters), being.
25. Whole word, the heaviest of the earths. Left, a fastener; right, twitching (medical).
26. Whole word, son of a king. Left, a disease; right, king.

ANSWERS TO PUZZLES OF FEB. 23D.

CROSS PUZZLE.

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Farm and Garden.

[The Agricultural Editor will be glad to receive any practical hints, suggestions or information that will make this department more valuable to those of our subscribers who feel specially interested.]

WINTER WORK ON THE FARM.

BY DR. GEO. G. GROFF.

IT is desirable, as far as practical, to keep farm hands employed the whole year, for steady employment will secure a much better class of laborers than if work is uncertain and at irregular intervals. The question, however, resolves itself into this, Can the farmer find profitable employment for his regular force of men during the winter months, when the earth is frozen up and regular farm operations are impractical? On the small farms, those ranging in area from 40 to 125 acres, and where but one man, or a man and a boy are employed, it is the rule in Pennsylvania to give them work during the whole year. The man is paid regular wages each month, while the boy is often paid wages only during the summer months, or while he can work in the field; but in winter he is boarded and sent to the public school for three or four months. These men board in the farmer's family, and are treated as members of the family. Near the large towns, it is true, the system is going out of fashion, and men are more and more living in their own homes, and being employed only when urgently needed. This seems to be largely due to the extensive employment of machinery, which enables work to be accomplished in a short time, and less labor is needed than formerly. It is a gain for the farmer and his family, but a loss to the laborer.

HAULING OUT STABLE MANURES.

Many of our best farmers are now placing all the stable manure they make on the soil as soon as possible. At no other time in the year is there so much leisure for this work as in the winter season. When the snow is on the ground, sleds can be employed and hard and heavy hauling made easy. Many farmers still object to placing manure on the ground in the winter for fear that it will in some manner or other be carried away, and never reach the soil. Many are especially afraid to place it on the snow, fearing that it will run off with the snow water and so be lost. Some think it will evaporate and so disappear. Now, it is certain that nothing will evaporate from the manure except water, and the clouds will replace that. Experiments have shown that even on steep hillsides there is very little loss of manure from being carried down by melting snows and rain. The soil has such an affinity for the fertilizing materials that they are drawn into it and do not run off. Some farmers, to guard against any possible loss, cultivate hillsides in belts, so that if any manure, or even soil is carried down by running water, it is caught and held by an uncultivated belt below, which for this purpose is best in grass, and the more of this on the ground the better. No one should, however, place manure in places where there are regular water courses when the snows melt, nor in exposed places where it may be blown away during high winds of winter or spring. Ashes and composts are now best placed in orchards and around all kinds of trees and vines. There will be no loss of material. It will all be absorbed by the soil.

The stable manure probably does the most good, if it is placed on the sod which is to be sowed in the spring for corn. This plant is a grass feeder, and its roots seem to have more power than those of other grain plants to utilize partly rotted material. If the manure is not placed on the cornfield, it should then go to top-dress the different grass fields. If the wheat is very thin in places, a light top-dressing of stable manure may be applied there.

IMPROVE THE FARM.

There are really generally but few days in winter when the men cannot be doing some work to improve the farm. There are often rocks and stumps to be dug out and burned or buried. If the weather is very cold, a fire of old wood may be made beside his work, and a man can warm himself and tools and keep at work in very cold weather. A stump is best dug while it is attached to the tree, which, by its weight, will help tear it out of the earth, and in falling will lift the stump out of the hole. If the tree has already been removed, then the use of dynamite may be the quickest and easiest mode of disposing of it. If there is no use to which the stones can be put, they can be buried out of sight, tho we would suggest that all the stones on our farms ought to go into the public highways to permanently improve them. To be sure, farmers should be paid for all the expense of placing them in the roads.

The men may also be sent to the timber lot to cut firewood, fencing timber, bean poles, pea brush, etc.; material which will be needed in the spring and summer. The forehanded farmer will have all these things cut and hauled home, the poles and brush pointed, the fencing timber made ready to use, and the wood all cut, ready to burn. These jobs out of the way, there will need be but little rush or hurry in the spring.

IN THE ORCHARD.

Trees may be trimmed in the latter part of winter. It is best for the owner to mark with chalk all the limbs that are to be removed, and the exact place where they are to be cut. Ordinary farm help is generally not enough interested in trees to be trusted to do more than take out dead limbs from an old orchard. After every heavy fall of snow it is well to tramp the snow hard about each young tree, if field mice are abundant. This will prevent them from reaching the trees. Good work may also be done at this time in searching for and destroying insect eggs, grubs, etc. The scales on the trunks of old trees may all be scraped off and the trees washed with a strong solution of soft soap or of lye. The limbs should also be searched with great care for the eggs of various caterpillars. In young orchards these are readily found and destroyed. If this work is done with care the ravages of many insects will be greatly lessened the next season.

CARE OF THE STOCK.

In our Northern States all stock must be warm and comfortable to do well and save feed. Stables should be well ventilated, best at the ridge; but they should not be so cold that water will freeze in them even in the coldest weather. How uncomfortable must many animals be chained in a small stall, with the temperature below zero, and no opportunity to get warm through exercise. Many farmers do not seem to realize that an animal exposed to cold will eat nearly double what one warm and comfortable will consume; but such is the fact. They must be kept warm either by warm walls or by extra feed, or else will be injured by the cold. Cows warm and comfortable will yield a profit in milk and butter, while those in a cold, cheerless stable will only be an expense. We urge upon all who think stock need exposure to make them hardy to try this winter the results of warm, well-ventilated stables. Put in windows too, so that an abundance of sunshine may enter the stables.

Colts should be turned out into a lot every day to run and exercise. Brood mares ought to be exercised daily too. Care must be taken with these that they do not slip and fall on the ice, which may result in an abortion, tho as many of these occur from want of exercise as from any other one cause. Curry horses and cows daily, and keep them thoroughly comfortable.

READ, STUDY AND LAY PLANS FOR THE FUTURE.

The long winter evenings offer to the farmer and his boys excellent opportunities for reading and study. They should certainly be devoted in large part to mental improvement. The leading agricultural papers should all be accessible. This is readily accomplished at small cost by forming a magazine and book club, by which means the cost of papers and books is distributed among six to ten or more congenial families. The papers take a definite course around the circle, remaining not longer than one week in each family or a shorter time as may be agreed upon. After all have read each paper they pass to the hands of the secretary who holds them all until the annual meeting, when an auction is held and permanent possession is given to the one who bids the highest price. Papers, magazines and books in this way may be brought within the means of all farmers. If the club were to hold a monthly meeting, or in winter more frequently, for the discussion of topics of general interest, the value of such an organization would be greatly increased.

But transient literature should not exclusively occupy the time of the live farmer; he should acquaint himself with the elements of those sciences which directly bear upon his calling. Among these sciences are chemistry, which lies at the very basis of modern agriculture; geology, which explains the origin of rocks and soils; botany, which treats of plant life in all its varied forms; meteorology, which explains the phenomena of the atmosphere, so important to every tiller of the soil; zoology, to give him some idea of the great classes of the animal kingdom: and physiology, that he may more clearly understand the phenomena exhibited by all living things. The man who knows something of these sciences ought to be a better farmer therefor, and he ought certainly to enjoy life much more than if he had no knowledge of them. This knowledge can be secured by a determined effort and systematic habits of reading. Two hours each evening of careful reading will soon carry one through the elements of all the above-named sciences. It would be well for young men determined to read and study, to adopt the celebrated rule of Luther, when he was translating the Bible. It was "never a day without a verse." Persistent reading will accomplish wonders in a few years.

The winter is also the time to lay careful plans for the next year's work. No one can hope to long succeed who does not plan ahead. Where to plant, how to better cultivate the soil, how to care for the stock, how to buy at better advantage—all these things should be thought out during the long winter evenings. Now, too, is the time to secure and study the catalogs of the seedsmen, nurserymen and implement dealers. The world moves all the time. The farmer cannot afford to try every novelty in plant and implement, but it will pay to devote a little time every year to examining and experimenting with promising novelties. Some of them may be prizes, others will prove worthless, yet the watching them develop will be time well spent. It will give a new zest to rural life. Horticulturists generally become enthusiasts, even when they are not financially successful. Why should the same not be true of the general farmer?

LEWISBURG, PENN.

BEAUTIFY THE HOME.

BY H. T. FORD.

IN traveling through the rural districts of our country, and especially in the West, nothing impresses one more strongly or painfully than the careless and even slovenly appearance of the average farmer's home. Indeed, it lacks most of the elements which should belong to a home. It is rather a place in which to stay than a place in which to live. It supplies only the absolute necessities which Nature imposes. It is hardly more than a shelter from the weather, a protection for the animal nature. We have often seen barns for the stock very much better and more costly than the house for the family, the barn neatly painted while the house was unpainted and dilapidated. And we have often seen the house in the midst of the cowyard, the fowls, swine, cattle, mules and horses the companions of the family outside, and not unfrequently some of the animals having free access inside. The house and barn in close companionship, thus situated on the naked prairie, is sufficiently uninviting and repellant.

Such a home and surroundings are a most unfortunate mold for the character of children. Instead of beautifying, it mars and defaces the native prairie. A feeling of pain makes us turn our eyes away and hasten fast. The average farmer utterly fails to appreciate the value of beauty. It does not seem even to occur to him tha there is any value in it, or that it is of any importance to him or to his family. His whole thought and effort are given to raising grain and stock and perhaps improving his fields, while the home is utterly neglected, and as barren of beauty, pleasure, or even comfort, as a desert. He misses the choicest element, the very cream of life.

No one has such an opportunity for making the home a little paradise as the farmer. The first and most essential requisite he has in abundance—viz., the broad acres. With neighbors at a distance, and land worth only from $5 to $20 an acre, his grounds for culture and the development of beauty may be as broad as he likes. Those living in town are cramped up in a very small space, with lots only 25, 50 or possibly 100 feet front; and yet it is surprising to see what a wealth of beauty a little taste and labor will produce on a 25 foot lot, and how attractive the home, a constant invitation, pleasure and rest to the business man, wearied with the toil and disgusted with the anxieties and annoyances of business.

There are towns which are distinguished for their beauty and attractiveness the country over. Their beauty invites the best class of people, and causes a rapid growth in population and wealth. People of wealth seeking a home and place to train and educate children look for these towns. And in these towns and cities property on the streets which have been highly cultured and made beautiful is worth in the market many times more than on other and perhaps adjoining streets. Cleveland, O., is chiefly noted for its Euclid Avenue, and the one feature of Euclid Avenue is its beautiful homes, and the beauty is not so much in the architecture as in the spacious, highly cultured grounds. Kalamazoo, Mich., is distinguished in the entire State as its most beautiful town, and its beauty and attractiveness invites population and wealth and help schools and churches and business and growth and prosperity in every direction. Madison, Wis., is having a fine growth in population and wealth, not because it is a natural business center, which it is not, or because it is the Capital of the State, but because it is the most beautiful town in the State, and so the most attractive and desirable for a home. There are towns in New England which attract population and wealth, and grow by their beauty. City people seeking a summer residence, and those seeking a place in which to educate children, or to spend the happy evening of their days, turn instinctively to these beautiful towns, and the streets where the grounds are most spacious and the lawns and flowers and trees most abundant, and without much reference to the cost of the home. Beauty becomes not only a source of happiness, but a harvest of wealth wherever it is developed.

The contrast between the rural districts of England and America in this matter is very great, and greatly to our disadvantage and loss. Is not the beauty and attractiveness of the home, a chief reason why so few English farmers leave England, while the unsightliness and wretchedness of Irish homes is the reason why so many of them leave Ireland?

It will be said that the American and especially the Western farmer is too poor, that he cannot command the means to beautify his home. This is a very sincere, but a very mistaken belief. It is not money, but taste and odd hours which are required. A beautiful home is a luxury in which the poorest may largely indulge, and it is about the greatest luxury of life. With his ample acres the farmer may make his home in the center of a little park, which shall grow every year more and more beautiful as long as he lives. Let him in the beginning set apart from two to ten acres, as a park, or home grounds, to be carefully and neatly fenced in and protected. It will take but little time and labor to turn at least a portion of these acres into a beautiful velvet lawn. The change from the muddy, filthy cowyard to the smooth, green lawn, can be made with small labor and at odd hours. It does not take long to plant a tree, and when once planted Nature will take care of it. From year to year for the next fifty years, or even for a century, it will increase in size, in beauty and in value. There is many a tree in Old England and in New England which could not be bought for $1,000. There is a beauty and magnificance and charm about them, and even a kind of companionship against which you can hardly place money. Home would not be home if they were gone. They are a constant benediction upon the home.

The old elms of New Haven are the charm of the city. And the farmer, with his

broad acres and a little work could have, after a time, the weeping elms with their magnificent and graceful forms, the hard maple with its stately and shapely form and highly colored autumnal foliage, and the grand oak and the evergreens and ornamental mountain ash, and in fact a hundred varieties if he desire. A friend in Pennsylvania placed his home in the midst of a little park of fourteen acres, in which he had planted some 200 varieties of trees, with accompanying lawns and flowers; and as they grew the park became almost a paradise, and its money value increased with the beauty.

It takes a little work to culture flowers, but there is nothing which runs more rapidly into value, nothing which pays so high an interest. The endless variety of flowers at command, and the wealth of beauty to be developed, produces not only the highest pleasure, but a commercial value exceeding that of any other crop. The lawns, the flowers, the vines, the trees, are at the command of every farmer. There is practically no limit to the beauty and pleasure and value with which the farmer may surround his home.

An expensive house is by no means essential to the most attractive, enjoyable and even palatial home. The finest and most costly production of human art and architecture is of small account when compared with the beauty which Nature produces. The inexpensive but neat one-story cottage of the poor farmer in the midst of his little park, in the chief elements of beauty, and in all the elements of happiness, may be more than equal to the palace of the millionaire. Jay Gould's castle on the Hudson is nothing apart from the grounds, the lawns, the flowers and the trees. Those who visit it go to see the grounds, the art of Nature and not the art of man. The same castle on the bare prairie or in the cowyard would attract no visitors.

It is to secure the broad acres and room for the little paradise of beauty that the millionaire goes to the country for his home and happiness. His city residence is only a place in which to stay while he makes his money. His country home is the place where he lives and finds his happiness. He works and makes his money in the city to spend it in his country home. The farmer has the ample space and all the natural advantages, and with a little taste and labor could easily rival the millionaire in the beauty and happiness of his home.

There is also a high commercial value in beauty which the common farmer fails to discover. One wishing to buy a farm will always select the one with a beautiful home, other things being equal. Nothing the farmer can do will make his place so salable, or add so largely to its commercial value as the development of beauty about his home. Every rod of lawn, every tree, every vine, every flower, every object of taste or beauty, adds to its value in the market. The growth of every tree is adding, and largely, every year to the value of the farm.

Thirty-five years ago Central Park, N. Y., was the most unsightly, repulsive spot you might see in many a day's travel. Passing by that locality in the cars we were accustomed to shut our eyes or occupy them inside the cars, to avoid the disgusting sights. Barren ground, mud holes, jagged rocks, swine, goats, geese, shanties for the poorest, most depraved and beastly part of the population, the refuse, the off-scouring and dumping ground of a great city. Today it is the most beautiful and attractive spot between the two oceans. The mud holes have been turned into beautiful little lakes, with white swans gliding gracefully over their bosom, spanned by bridges which are works of art; their borders decorated with lawns, flowers and trees. The rough rocks are covered with vines and flowers. Every unsightly and repulsive spot has been turned by the hand of the skillful artist into a scene of beauty. It is now the chief attraction of the country's metropolis.

What the city of New York has done for itself in Central Park, the farmer may do for himself on a smaller scale with a little taste and work, in making a little park about his home. The grass, the vines, the flowers, the trees, will grow as beautifully on the praries about the farmer's home as in Central Park.

KANSAS CITY, MO.

APPLES FROM NEW MEXICO.

A RELATIVE of mine living at La Luz, N. Mex., near the mountains, 150 miles north of El Paso, Tex., sent me recently apples grown there, desiring me to name them. The apples were certainly Ben Davis, but the largest, highest-colored, and most perfect and beautiful specimens of this showy apple I have ever seen. They were without blemish or defect of any kind. The largest was 12¼ inches in smaller circumference, and weighed 13 ounces.

My friend tells me that apple trees planted in that valley, in fields of wheat or alfalfa, usually bear so heavily the second year from setting that much of the fruit must be removed to prevent the trees breaking. Certainly if such apples as these can be produced abundantly in many parts of New Mexico, apple growing would be more profitable than stock raising now is. Peaches, plums and European varieties of grapes succeed as well in New Mexico as in California, while the many mining towns supply a near and good market, and the abundant productive Government land, subject to entry under the homestead laws, offers great inducements to settlers. Wheat, oats, barley, alfalfa sorghum and all vine and root crops succeed admirably.

At the winter meeting of the Missouri State Horticultural Society, held at Carthage, Mo., last December, apples from Eddy, N. Mex., were shown that very greatly excelled in size, beauty and value the large collections from Missouri and Arkansas, localities noted for the beauty and excellence of their apples.—*Correspondence of The Cultivator.*

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Weekly Market Review.

WHOLESALE QUOTATIONS TO COUNTRY MERCHANTS.

[*For the week ending Thursday, Feb. 23d, 1893.*]

TEA.—There are some weak spots in the market, and holders have ceased trying to push up values for the present. Japan is quoted at 11@35c.; Amoy, 14@18c; Fuchau, 14@35c.; new Formosa, 17@42c.

COFFEE.—Business is quiet, and all grades are fairly sustained. Maracaibo is quoted at 19@23c.; Mocha, 23@23½c.; Laguayra, 19½@23½c.; Java, 21½@30c.; Brazil, 17½@18c.

SUGAR.—Refined is quiet and almost the same as last week. Cut loaf and crushed are 5¼@5.44c.; powdered, 4⅞@5 1-16c.; granulated, 4⅝@4.81c.; Mould "A," 4⅞@5.06c.; Columbia "A," 4¾@4.56c.

MEATS AND STOCKS.—Dressed calves are firmer and in fair demand. Country dressed veals are 8@11½c., and city dressed 8@12½c. Common to choice veals are 5@9c. per lb. Dressed mutton is slow at 8@9½c., and dressed lambs weak at 9@10c. Country dressed spring lambs are 5@9½c. Country dressed hogs are quiet at 10@10½c. for heavy, and 10½@11c. for light.

FLOUR AND MEAL.—The market for flour rules rather easy, especially for trade brands. Exporters have been rather more active in taking goods for shipment, but domestic trade languishes. City mill patents are quoted at $4.40@4.65; and clears at $4@4.10 per bbl. Spring patents are $4.20@4.60; straights, $3.85@4.15, and clears, $2.85@3.25. Winter patents are $3.90@4.20; straights, $3.50@3.75, and clears, $3.15@3.40. Buckwheat flour is dull at $2.10@2.15, and rye flour is selling moderately at $3.10@3.35. Cornmeal is dull but steady at $2.90 for Brandywine, and $2.80@2.90 for Southern and Western.

GRAINS AND HAY.—The spot market for wheat has been active this week for export, and this promises to continue so long as present prices rule. The option market is very dull, and no reports seem to affect prices much either one way or the other. No. 1 Northern wheat is steady at 84½@84¾c.; No. 2, 83½@83¾c.; and No. 1 hard, 88@88¼c. In corn speculation is a little better, and the cash market rules very strong. No. 2 mixed is 52½@53½c., and ungraded mixed, 49@52c. Oats are more or less in sympathy with wheat, and futures rule very dull without any speculation of note, while the spot market grows firmer. No. 2 white oats are 41@41½c.; No. 3, 40c., and ungraded Western mixed, 37½@39½c. Barley is steadily held at old quotations, with a good inquiry for Western at 60@75c., and six-rowed State at 75@78c. Rye is still neglected at 57@59c. on track.

BUTTER AND CHEESE.—Butter is way down. The cold snowstorm of this week developed some strength in the trade, but it quickly declined. Holders are glad to make sales at present quotations, or even less on large lots. Pennsylvania and Western separator goods are worth only 28@28½c., and Western firsts are 25@27c., and seconds, 23@24c. New State dairy tubs are irregular in quality and quantity, and the range is 22@26c., with some fancy at 27c. Old State dairy largely neglected. Western imitation creamery dull at 21@24c., and Western factory very weak and slow, at 21@23c. Cheese is almost unchanged. The quotations do not place the best quite so high, but it is more due to the fact that strictly fancy small creams are out of the market. Small white and colored are 12¼@12½c., and cheddar fancy 12c. Fall skims, common to choice, are 7@10½c., and Chenango skims, 7¼@10½c.

POULTRY AND EGGS.—Up to the mid-week holiday live poultry was scarce in the markets, and prices were well maintained on all desirable goods. Fowls were 14½@15c.; chickens, 13@14c., and turkeys, 14@16c. per lb. Old roosters were 8½@9c. Dressed poultry is firm and few lots have arrived. Others are expected shortly, and prices may weaken within a day or two. Selected turkeys are 16@18c., and other stock, 11@16c. per lb. Philadelphia chickens are 15@19c., and others, 14@17c. Fowls are firm at 14@15c., and old roosters at 11c. Ducks of good quality are 12@15c., and geese, 11@14c. Capons are in fair demand at 14@22c. per lb. Squabs are firmer at $3.25@4.50 per doz. Eggs are in liberal supply, and the markets did not clean up for the holiday. Outside prices are 28@28½c. per doz. for new-laid Eastern; and 28c. for Western, and 27@27½c. for Southern. Duck eggs are 35@37c. per doz.

BEANS AND VEGETABLES.—Marrows are dull but unchanged at $2.45@2.50 per bus. Medium are scarce and firm at $2.20, and pea steady at $2.25. Potatoes are in fair demand and domestics are in light receipt. The range of prices is $2.50@3.25 per bbl., and foreign magnums, $1.50@2.25 per sack. Bermudas are $3 50@6 per bbl., and sweets, $3@5. Onions are high at $4@5 for white, $3.50@4 for yellow, and $3.25@3.75 for red. Other vegetables in fair demand at quotations: Key West tomatoes, $1@2.50 per crate; turnips, 75@90c. per bbl.; squash, $2@2.25; Norfolk spinach, $1@2; string beans, $1@3 per crate; Florida lettuce, $3@7 per bbl.; Norfolk kale, $1@1.25; green peas, $2@3 per crate; Florida beets, $2@2.25; carrots, $1.25 per bbl.; Cal. cauliflower, $4@6 per case, and L. I. cabbages, $5@10 per 100.

DRIED AND FRESH FRUITS.—The market for dried fruits is quiet, and only a moderate movement in evaporated apples. Fancy are 11½c., and common to choice, 8@10½c. Sun dried are 5½@7c., and peaches easy at 11@15c. per lb. Raspberries are firmer at 22@24c., and cherries steady at 17@20c. Desirable stocks of apples are firm and steady, altho demand is light, but poor stock is dull. Spitzenbergs are quoted at $2.50@3.50 per bbl.; Greenings, $2@3.50; Baldwins, $2@3.25, and Northern Spy, $2@3.25. There is little doing in grapes, but fancy are firm at 15@20c. per 5 lb. basket. Cranberries are quiet, but good stock is steady at $7.50@10 per bbl. for Cape Cods, and $2.5@2.75 per crate for Jerseys. Florida fruits in good demand if quality is fine. Indian River oranges are $3@4 per box, and others, $1.50@2.75. Grape fruit easy at $1.50@3 per box; mandarins quiet at $1.50@3, and tangerines at $2.50@5.

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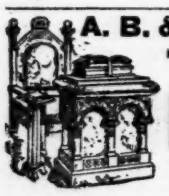

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